

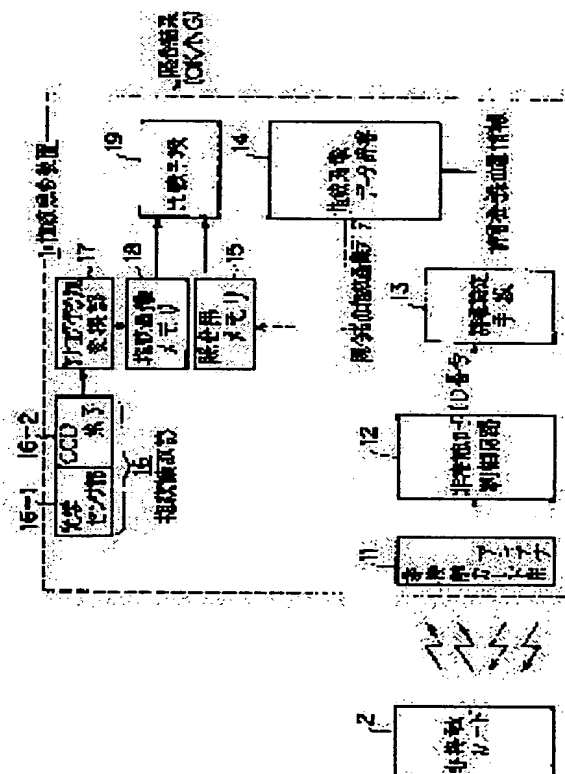
# PATENT ABSTRACTS OF JAPAN

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(57) Abstract:

CONSTITUTION: A finger print collating device consisting of a finger print reading part 16, a finger print image memory 18, a finger print image data dictionary 14, and a collating memory 15 and a contactless card 2 holding an ID number are prepared and constituted so that finger print image data read out from the dictionary 14 based upon the ID number contactlessly read out from the card 2 are stored in the memory 15, finger print image data read out from a collator's finger are stored in the memory 18, both the finger print image data are collated with each other, and a collated result OK/NG is outputted.



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CLAIMS

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## [Claim(s)]

[Claim 1] The fingerprint read station which reads a fingerprint in the fingerprint collation device which reads and collates a fingerprint (16). The fingerprint image memory which stores the fingerprint image data which this fingerprint read station (16) read (18). The fingerprint image data dictionary which matched with the ID number and registered fingerprint image data beforehand (14). The fingerprint collation device which prepared the memory for collating (15) which stores the fingerprint image data read from the above-mentioned fingerprint image data dictionary (14) based on the ID number read in the non-contact card (2) by non-contact (1). While storing in the above-mentioned memory for collating (15) the fingerprint image data which was equipped with the non-contact card (2) holding an ID number, and the fingerprint collation device (1) took out from the above-mentioned fingerprint image data dictionary (14) based on the ID number read in the above-mentioned non-contact card (2) by non-contact The fingerprint image data read in a collating person's finger is stored in the above-mentioned fingerprint image memory (18). The fingerprint collation device characterized by constituting so that the fingerprint image data read from this fingerprint image memory (18) and the fingerprint image data read from the above-mentioned memory for collating (15) may be collated and collating result OK/NG may be outputted.

[Claim 2] The fingerprint read station which reads a fingerprint in the fingerprint collation device which reads and collates a fingerprint (16). The fingerprint image memory which stores the fingerprint image data which this fingerprint read station (16) read (18). The fingerprint collation device which prepared the memory for collating (15) which stores the fingerprint image data read in the non-contact card (2) by non-contact (1). While storing in the above-mentioned memory for collating (15) the fingerprint image data which was equipped with the non-contact card (2) holding fingerprint image data, and the fingerprint collation device (1) read in the above-mentioned non-contact card (2) by non-contact The fingerprint image data read in a collating person's finger is stored in the above-mentioned fingerprint image memory (18). The fingerprint collation device characterized by constituting so that the fingerprint image data read from this fingerprint image memory (18) and the fingerprint image data read from the above-mentioned memory for collating (15) may be collated and collating result OK/NG may be outputted.

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the fingerprint collation device which reads and collates a fingerprint. In the case of being related with entrance into a room and entrance of facility HE, the terminal use, and the treatment of money as which a computer room and advanced security are required -- there is fear of loss, a theft, and forgery in the ID card used so far as a means of a check. Moreover, many problems are pointed out from the field of security reservation, such as being guessed easily [ a personal identification number etc. ] from a birthday, the telephone number, etc.

[0002] two major descriptions [ fingerprint ] "it is "an everybody different" and eternal throughout life" -- having -- a fingerprint -- him -- the palm whose fingerprint authentication techniques used as a means of a check are other individual collating techniques -- compared with type, a retina, voice, etc., it is considered the most leading means.

[0003] him by the magnetic card or the IC card -- a check checks the justification of the card itself -- \*\*\*\* -- it does not pass but the owner is just -- having not carried out that check -- receiving -- fingerprint authentication -- him -- the points of checking whether it being the very thing differ greatly. For this reason, although the fingerprint collation device is used for close leaving to the location where advanced security is demanded, the check of the royalty of a terminal, etc. in current, to make it easier for that operability to be bad and to use it is desired.

[0004]

[Description of the Prior Art] A fingerprint collation device has a configuration as shown in drawing 7 , and performs the comparison with the fingerprint image data incorporated by the fingerprint sensor (the photo-sensor section 55 and CCD component 56), and the fingerprint image data which was made to read an ID number by the card reader with a key input or a magnetic card, an IC card, etc., and took out a keyboard to the ID number (identification number) from the fingerprint image data dictionary 53 by this ID number, and he was trying to judge conventionally whether you are him. Actuation of the configuration of drawing 7 is explained briefly below.

[0005] (1) A collating person keys an ID number from the keyboard which is the ID number input means 51, or makes an ID number read a magnetic card by the card reader.

[0006] (2) Ask for the location of the fingerprint image data dictionary 53 which stored \*\*\*\* for the fingerprint image data whose dictionary specification means 52 is two or more persons based on the ID number of (1), take out the fingerprint image data of the individual of the ID number concerned, transmit to the memory 54 for collating and store in it.

[0007] (3) In parallel to (2), a collating person places a finger on the photo-sensor section 55. The CCD component 56 reads the fingerprint image of a finger by this, and it changes into the electrical signal of an analog, and the analog-to-digital conversion section 57 changes this analog signal into a digital signal, and stores the fingerprint image data of the same format as dictionary data in the fingerprint image memory 58.

[0008] (4) The fingerprint image data of the collating person who read from the fingerprint image memory 58 is compared with the fingerprint image data of the ID number read from the memory 54 for collating, calculate similarity and whenever [ correlation ], and consider as the collating result O.K. at the time of whenever [ beyond the threshold defined beforehand / the similarity and whenever / correlation ], and the comparison means 59 outputs as a collating result NG, when that is not right.

[0009]

[Problem(s) to be Solved by the Invention] As mentioned above, at the time of collating

initiation, the fingerprint collation device 51 of conventional drawing 7 makes the ID number which inputted the ID number (identification number) which is the ID number input means 51 first, and which specifies a collating person individual, for example from a keyboard, or was beforehand recorded on the portable storage of a magnetic card, an IC card, etc. read by a card reader etc., and takes out the fingerprint image data of a collating person's fingerprint from the fingerprint image data dictionary 53 based on this. Next, since the fingerprint image data read in a collating person's actual finger was compared and collating result OK/NG was judged, it will be forced two steps of actuation of inputting an ID number and laying a finger on the photo-sensor section 55, for a collating person, and there was a problem of being hard to use at a big burden. Moreover, it compared the fingerprint image data registered out of the fingerprint image data dictionary 53 based on the actual fingerprint image data read in a collating person's finger in order to lose the input of a collating person's ID number, and one by one, and in having calculated and judged similarity and whenever [ correlation ], when the number of the fingerprint image data registered increased, the time amount for judgment processing was mostly needed, and there was a problem were not realistic.

[0010] Without operating an input of an ID number, insertion of a magnetic card, etc. by a ten key etc., this invention reads a collating person's ID number (or fingerprint image data) in a non-contact card by non-contact, performs fingerprint authentication with the fingerprint image data of a collating person's finger, and aims at making fingerprint authentication possible by easy actuation.

[0011]

[Means for Solving the Problem] Drawing 1 shows the principle block diagram of this invention, and drawing 2 shows other principle block diagrams of this invention.

[0012] In drawing 1 and drawing 2, a fingerprint collation device 1 consists of the fingerprint image data dictionary 14, the memory 15 for collating, a fingerprint read station 16, fingerprint image memory 18, a comparison means 19, etc.

[0013] The fingerprint image data dictionary 14 is a dictionary which matched with the ID number and registered the fingerprint image beforehand. The memory 15 for collating is memory which stores the fingerprint image data for collating.

[0014] The fingerprint image memory 18 is memory which stores the fingerprint image data read by the fingerprint read station 16. The comparison means 19 compares the fingerprint image data taken out from the fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, and judges collating result OK/NG.

[0015] The non-contact card 2 is a card which made an ID number and fingerprint image data hold.

[0016]

[Function] As this invention is shown in drawing 1, while storing in the memory 15 for collating the fingerprint image data which the fingerprint collation device 1 took out from the fingerprint image data dictionary 14 based on the ID number read in the non-contact card 2 by non-contact. The fingerprint image data read in a collating person's finger is stored in the fingerprint image memory 18, the comparison means 19 compares the fingerprint image data taken out from this fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, and he is trying to output collating result OK/NG.

[0017] Moreover, as shown in drawing 2, while a fingerprint collation device 1 stores in the memory 15 for collating the fingerprint image data read in the non-contact card 2 by non-contact, the fingerprint image data read in a collating person's finger is stored in the fingerprint image memory 18, the comparison means 19 compares the fingerprint image data taken out from this fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, and he is trying for this invention to output collating result OK/NG.

[0018] Therefore, a collating person does not need to input an ID number from a keyboard etc., or does not need to insert a magnetic card in a card reader, performs fingerprint authentication by easy actuation of only laying a finger in the fingerprint read station 16, and becomes possible [ that unlocking etc. carries out a door ].

[0019]

[Example] Next, the configuration and actuation of one example of this invention are explained to a detail one by one using drawing 6 from drawing 1.

[0020] Drawing 1 shows the principle block diagram of this invention. This is a block diagram in the case of reading an ID number (identification number) in the non-contact card 2 by non-contact, taking out the fingerprint image data of this ID number from the fingerprint image data dictionary 14, comparing the fingerprint image data of a collating person's finger

with this, and judging collating result OK/NG.

[0021] In drawing 1, a fingerprint collation device 1 collates the fingerprint image data taken out from the fingerprint image data dictionary 14, and the fingerprint image data which read the fingerprint of a collating person's finger by the fingerprint read station 16 based on the ID number read in the non-contact card 2, judges collating result OK/NG, and consists of 11 thru/or 19, etc.

[0022] The antenna 11 for non-contact cards is an antenna which calls the non-contact card 2 through radio, is made to send out the ID number etc. through radio, and is received. that the non-contact card control circuit 12 takes out the ID number of the non-contact card 2 from the signal which discharged the electric wave or was received with the antenna 11 for non-contact cards through the antenna 11 for non-contact cards \*\*\*\* -- etc. -- the exchange by the electric wave with the non-contact card 12 is controlled.

[0023] The dictionary specification means 13 pinpoints the dictionary registration location for taking out the fingerprint image data of the finger of the collating person of the ID number concerned from the fingerprint image data dictionary 14 based on the ID number of the non-contact card passed from the non-contact card control circuit 12, and outputs it as dictionary registration positional information.

[0024] The fingerprint image data dictionary 14 is a dictionary which registered the fingerprint image data of a collating person's finger beforehand. The memory 15 for collating is memory which takes out the fingerprint image data corresponding to the ID number read in the non-contact card 2 from the fingerprint image data dictionary 14, and stores it.

[0025] The fingerprint read station 16 reads a fingerprint in a collating person's finger, generates fingerprint image data, and consists of the photo-sensor section 16-1 and a CCD component 16-2.

[0026] The analog-to-digital conversion section 17 changes into digital fingerprint image data the fingerprint image data of the analog of the fingerprint of the finger of the collating person who read by the fingerprint read station 16.

[0027] The fingerprint image memory 18 is memory which stores the digital fingerprint image data after changing by the analog-to-digital conversion section 17. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data corresponding to the ID number taken out from the non-contact card 2, and it outputs the collating result NG noting that it calculates similarity and whenever [ correlation ], and it is in agreement and is not in agreement, when smaller than the collating result O.K. and a predetermined threshold, when larger than a predetermined threshold.

[0028] Next, actuation of the configuration of drawing 1 is explained.

(1) Approach the location in which the collating person held the non-contact card 2, and the fingerprint collation device 1 was installed, and correspond to the call by the electric wave from the antenna 11 for non-contact cards, and the non-contact card 2 puts a self ID number on an electric wave, and sends it out automatically.

[0029] (2) The antenna 11 for non-contact cards receives the electric wave sent out by (1), and the non-contact card control circuit 12 takes out an ID number, and pass the dictionary specification means 13.

(3) A dictionary specification means 13 by which the ID number was passed by (2) generates the dictionary registration positional information which is the location information which reads the fingerprint image data of the ID number concerned from the fingerprint image data dictionary 14, and inputs it into the fingerprint image data dictionary 14. And the fingerprint image data corresponding to the ID number read from the fingerprint image data dictionary 14 is stored in the memory 15 for collating.

[0030] (4) Lay a finger in the fingerprint read station 16, and read the fingerprint image of a finger by the photo-sensor section 16-1 and the CCD component 16-2 which constitute fingerprint \*\*\*\* 16 concerned, and by the analog-to-digital conversion section 17, a collating person changes the fingerprint image data of an analog into digital fingerprint image data, and stores in the fingerprint image memory 18.

[0031] (5) The comparison means 19 compares the fingerprint image data read in a collating person's finger taken out from the fingerprint image memory 18 with the fingerprint image data corresponding to the ID number taken out from the memory 15 for collating, similarity and whenever [ correlation ] are computed, judge with it being in agreement at the time beyond a predetermined threshold, output the collating result O.K., and output the collating result NG noting that it is not in agreement at the time of below a predetermined threshold.

[0032] As mentioned above, if the location where the collating person possessed the

non-contact card 2, and the fingerprint collation device 1 was set up is approached, automatically, the non-contact card 2 sends out an ID number through radio corresponding to the appeal by the electric wave from a fingerprint collation device 1, and stores the fingerprint image data corresponding to this ID number in the memory 15 for collating. Furthermore, if a finger is laid on the fingerprint read station 16 in which a collating person approaches a fingerprint collation device 1, and reads a fingerprint, corresponding to change of the shade of the image by having laid this finger, the fingerprint of a finger is read automatically, and that fingerprint image data is stored in the fingerprint image memory 18. And both are compared and the result is outputted as collating result OK/NG. Thereby, a collating person becomes possible [ performing fingerprint authentication only by easy actuation of laying a finger on the fingerprint read station 16 ].

[0033] Drawing 2 shows other principle block diagrams of this invention. This is a block diagram in the case of reading fingerprint image data in the non-contact card 2 by non-contact, comparing the fingerprint image data of a collating person's finger with this, and judging collating result OK/NG.

[0034] In drawing 2, a fingerprint collation device 1 collates the fingerprint image data read in the non-contact card 2, and the fingerprint image data which read the fingerprint of a collating person's finger by the fingerprint read station 16, judges collating result OK/NG, and consists of 11, 12, 15, 19, etc.

[0035] The antenna 11 for non-contact cards is an antenna which calls the non-contact card 2 through radio, is made to send out the ID number, fingerprint image data, etc. through radio, and is received. that the non-contact card control circuit 12 takes out the fingerprint image data of the non-contact card 2 from the signal which discharged the electric wave or was received with the antenna 11 for non-contact cards through the antenna 11 for non-contact cards \*\*\*\* -- etc. -- the exchange by the electric wave with the non-contact card 12 is controlled.

[0036] The memory 15 for collating is memory which stores the fingerprint image data read in the non-contact card 2. The fingerprint read station 16 reads a fingerprint in a collating person's finger, generates fingerprint image data, and consists of the photo-sensor section 16-1 and a CCD component 16-2.

[0037] The analog-to-digital conversion section 17 changes into digital fingerprint image data the fingerprint image data of the analog of the fingerprint of the finger of the collating person who read by the fingerprint read station 16.

[0038] The fingerprint image memory 18 is memory which stores the digital fingerprint image data after changing by the analog-to-digital conversion section 17. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data read in the non-contact card 2 taken out from the memory 15 for collating, and it outputs the collating result NG noting that it calculates similarity and whenever [ correlation ], and it is in agreement and is not in agreement, when smaller than the collating result O.K. and a predetermined threshold, when larger than a predetermined threshold.

[0039] Next, actuation of the configuration of drawing 2 is explained.

(1) Approach the location in which the collating person held the non-contact card 2, and the fingerprint collation device 1 was installed, correspond to the call by the electric wave from the antenna 11 for non-contact cards, put the fingerprint image data which the non-contact card 2 holds on an electric wave, and send it out automatically.

[0040] (2) The antenna 11 for non-contact cards receives the electric wave sent out by (1), and the non-contact card control circuit 12 takes out fingerprint image data, and store in the memory 15 for collating.

[0041] (3) Lay a finger in the fingerprint read station 16, and read the fingerprint image of a finger by the photo-sensor section 16-1 and the CCD component 16-2 which constitute fingerprint \*\*\*\* 16 concerned, and by the analog-to-digital conversion section 17, a collating person changes the fingerprint image data of an analog into digital fingerprint image data, and stores in the fingerprint image memory 18.

[0042] (4) The comparison means 19 compares the fingerprint image data read in a collating person's finger taken out from the fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, similarity and whenever [ correlation ] are computed, judge with it being in agreement at the time beyond a predetermined threshold, output the collating result O.K., and output the collating result NG noting that it is not in agreement at the time of below a predetermined threshold.

[0043] As mentioned above, if the location where the collating person possessed the

non-contact card 2, and the fingerprint collation device 1 was set up is approached, automatically, the non-contact card 2 sends out fingerprint image data through radio corresponding to the appeal by the electric wave from a fingerprint collation device 1, and stores this fingerprint image data in the memory 15 for collating. Furthermore, if a finger is laid on the fingerprint read station 16 in which a collating person approaches a fingerprint collation device 1, and reads a fingerprint, corresponding to change of the shade of the image by having laid this finger, the fingerprint of a finger is read automatically, and that fingerprint image data is stored in the fingerprint image memory 18. And both are compared and the result is outputted as collating result OK/NG. Thereby, a collating person becomes possible [ performing fingerprint authentication only by easy actuation of laying a finger on the fingerprint read station 16 ].

[0044] Drawing 3 shows 1 example block diagram of this invention. This is the example configuration of the configuration of drawing 1, and is a thing at the time of notifying collating result OK/NG from the comparison means 19 to the door control section 20 and a display and control section 22. It explains below.

[0045] In drawing 3, corresponding to the collating result O.K. from the comparison means 19, supply an unlocking signal to the electric lock 21, and it unlocks, or the door control section 20 supplies and carries out the closed lock of the closed lock signal to the electric lock 21.

[0046] The electric lock 21 is an electric lock installed in the door which carries out close recession. A display and control section 22 displays a message on a display 23 corresponding to collating result OK/NG from the comparison means 19. For example, when a finger is laid upwards at the fingerprint read station 16, without detecting "a room cannot be entered" and the non-contact card 2 corresponding to the collating result NG, a message with the "required" card for entrance into a room is displayed.

[0047] that an indicating equipment 23 displays a message \*\*\* -- etc. -- it carries out. Next, actuation of the configuration of drawing 3 is explained to a detail using the flow chart of drawing 4. In drawing 4, the non-contact card 1 with which a collating person possesses a call by the electric wave receives S1 from a fingerprint collation device 1. A collating person possesses the non-contact card 2, this approaches the location in which the fingerprint collation device 1 is installed, and the non-contact card 2 receives the call by the electric wave discharged from the antenna 11 for non-contact cards of a fingerprint collation device 1.

[0048] S2 transmits through radio the ID number of self [ card / 2 / which received the call through radio by S1 / non-contact ]. S3 searches a dictionary. This takes out an ID number out of the signal which the antenna 11 for non-contact cards of a fingerprint collation device 1 received the ID number transmitted by S2, and the non-contact card control circuit 12 received, generates delivery and dictionary registration positional information for the dictionary specification means 13, and searches and takes out the fingerprint image data of an ID number from the fingerprint image data dictionary 14 based on this.

[0049] S4 stores fingerprint image data in the memory 15 for collating. This stores in the memory 15 for collating the fingerprint image data of the ID number taken out from the fingerprint image data dictionary 14 by S3.

[0050] S5 distinguishes whether it is fingerprint detection. This distinguishes whether a collating person's finger was laid, and whether the fingerprint read station 16 became [ the shade of distinction and the image read by the fingerprint read station 16 when saying concretely ] larger than a predetermined threshold in parallel to processing of S1 thru/or S4. Since the fingerprint image of a collating person's finger was detected in YES, it progresses to S6. S5 is repeated and it stands by by carrying out in NO.

[0051] Since the fingerprint image of a collating person's finger was detected by YES of S5, S6 changes into the fingerprint image data of TEJITARU the fingerprint image read by the photo-sensor section 16-1 and the CCD component 16-2 which constitute the fingerprint read station 16 by the analog-to-digital conversion section 17, and stores it in the fingerprint image memory 18.

[0052] S7 collates and distinguishes whether it is coincidence. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data (fingerprint image data read from the fingerprint image data dictionary 14 based on the ID number read in the non-contact card 2) taken out from the memory 15 for collating, and this distinguishes whether it is coincidence in quest of similarity and whenever [ correlation ] above a predetermined threshold. In YES, the notice of unlocking is performed to the door control section 20 by S8,



the electric lock 21 is changed into an open condition, and a collating person enters the room. On the other hand, in not being in agreement, it carries out repeatedly from the beginning.

[0053] Drawing 5 shows the example of installation of the equipment of this invention. This is the example which attached drawing 3 and the drawing 6 fingerprint collation device 1. Actuation is explained.

\*\* A collating person is going to possess the non-contact card 2, walk along a path, and an advanced security management tends to enter the required interior of a room.

[0054] \*\* Go into the effective area of an electric wave where the antenna 11 for non-contact cards was discharged. The fingerprint image data which the non-contact card 2 which a collating person possesses in this condition corresponding to the call discharged from the antenna 11 for non-contact cards sent out the self ID number (or fingerprint image data) through radio automatically, and took out from the fingerprint image data dictionary 14 based on the ID number which received is stored in the memory 15 for collating (or fingerprint image data which received memory 15 for collating storing).

[0055] \*\* A collating person lays a finger on the fingerprint read station (fingerprint sensor) 16, and stores in the fingerprint image memory 18 the fingerprint image data which read the fingerprint image. And both fingerprint image data is compared, when in agreement, the door of electric lock control is opened, and a security management with an advanced collating person goes into the required interior of a room.

[0056] Drawing 6 shows other example block diagrams of this invention. This is the example configuration of the configuration of drawing 2, and is a thing at the time of notifying collating result OK/NG from the comparison means 19 to the door control section 20 and a display and control section 22. Moreover, since the door control section 20, the electric lock 21, the display and control section 22, and the display 23 are the same as that of the thing of drawing 3, explanation is omitted.

[0057] Next, actuation is explained with reference to the flow chart of drawing 4. Here, S12 is processed instead of S2 and S3 of drawing 4. The non-contact card 1 with which a collating person possesses a call receives S1 from a fingerprint collation device 1 by the electric wave. A collating person possesses the non-contact card 2, this approaches the location in which the fingerprint collation device 1 is installed, and non-contact card 2 receives the call discharged from the antenna 11 for non-contact cards of a fingerprint collation device 1.

[0058] S12 transmits through radio the fingerprint image data which the non-contact card 2 which received the call through radio by S1 holds. S4 stores fingerprint image data in the memory 15 for collating. This stores in the memory 15 for collating the fingerprint image data read in the non-contact card 2 by S12.

[0059] S5 distinguishes whether it is fingerprint detection. It distinguishes whether in parallel to processing of S1, S12, and S4, as for this, a collating person's finger was laid for the fingerprint read station 16. Since the fingerprint image of a collating person's finger was detected in YES, it progresses to S6. S5 is repeated and it stands by by carrying out in NO.

[0060] Since the fingerprint image of a collating person's finger was detected by YES of S5, S6 stores the read fingerprint image data in the fingerprint image memory 18. S7 collates and distinguishes whether it is coincidence. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data (fingerprint image data read in the non-contact card 2) taken out from the memory 15 for collating, and this distinguishes whether it is coincidence in quest of similarity and whenever [ correlation ] above a predetermined threshold. In YES, the notice of unlocking is performed to the door control section 20 by S8, the electric lock 21 is changed into an open condition, and a collating person enters the room. On the other hand, in not being in agreement, it carries out repeatedly from the beginning.

[0061] In addition, since it is necessary to register the fingerprint image data dictionary 14 beforehand into a fingerprint collation device 1 since the ID number is read in the non-contact card 2 by non-contact, and fingerprint image data is kept at the fingerprint collation device 1 side, the configuration of drawing 1 and drawing 3 has high security, and it is suitable [ configuration ] when managing receipts and payments of one specific facility etc.

[0062] On the other hand, since fingerprint image data is read in the non-contact card 2 by non-contact, the configuration of drawing 2 and drawing 6 does not need to register the

fingerprint image data dictionary 14 beforehand into a fingerprint collation device 1, and it is suitable [ configuration ] when managing receipts and payments of the dispersed facility etc.

[0063]

[Effect of the Invention] As explained above, according to this invention, the fingerprint image data which the fingerprint collation device 1 took out fingerprint image data dictionary 14 picking based on the ID number read in the non-contact card 2 by non-contact is stored in the memory 15 for collating. Or while storing in the memory 15 for collating the fingerprint image data read in the non-contact card 2 The fingerprint image data read in a collating person's finger is stored in the fingerprint image memory 18. Both fingerprint image data taken out from the memory 15 for these collatings and the fingerprint image memory 18 is compared and collated, and since the configuration which outputs collating result OK/NG is adopted, if fingerprint authentication is performed by easy actuation in which a collating person only lays a finger in the fingerprint read station 16, it can \*\*. Thereby, it is not necessary to perform actuation in which a collating person inputs an ID number from a keyboard etc. like before, or inserts a magnetic card in a card reader, and actuation becomes easy. Moreover, it becomes possible, when advanced security surveillance applies the fingerprint collation device 1 of this invention to the door to the required interior of a room to unlock a door and to enter a room, when an entrance person possesses the non-contact card 2, and performs fingerprint authentication only by laying a finger on the fingerprint read station (fingerprint sensor) 16 installed near the door and it is in agreement.

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TECHNICAL FIELD

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[Industrial Application] This invention relates to the fingerprint collation device which reads and collates a fingerprint. him in the case of being related with entrance into a room and entrance of facility HE, the terminal use, and the treatment of money as which a computer room and advanced security are required -- there is fear of loss, a theft, and forgery in the ID card used so far as a means of a check. Moreover, many problems are pointed out from the field of security reservation, such as being guessed easily [ a personal identification number etc. ] from a birthday, the telephone number, etc.

[0002] two major descriptions [ fingerprint ] "it is "an everybody different" and eternal throughout life" -- having -- a fingerprint -- him -- the palm whose fingerprint authentication techniques used as a means of a check are other individual collating techniques -- compared with type, a retina, voice, etc., it is considered the most leading means.

[0003] him by the magnetic card or the IC card -- a check checks the justification of the card itself -- \*\*\*\* -- it does not pass but the owner is just -- having not carried out that check -- receiving -- fingerprint authentication -- him -- the points of checking whether it being the very thing differ greatly. For this reason, although the fingerprint collation device is used for close leaving to the location where advanced security is demanded, the check of the royalty of a terminal, etc. in current, to make it easier for that operability to be bad and to use it is desired.

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PRIOR ART

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[Description of the Prior Art] A fingerprint collation device has a configuration as shown in drawing 7, and performs the comparison with the fingerprint image data incorporated by the fingerprint sensor (the photo-sensor section 55 and CCD component 56), and the fingerprint image data which was made to read an ID number by the card reader with a key input or a magnetic card, an IC card, etc., and took out a keyboard to the ID number (identification number) from the fingerprint image data dictionary 53 by this ID number, and he was trying to judge conventionally whether you are him. Actuation of the configuration of drawing 7 is explained briefly below.

[0005] (1) A collating person keys an ID number from the keyboard which is the ID number input means 51, or makes an ID number read a magnetic card by the card reader.

[0006] (2) Ask for the location of the fingerprint image data dictionary 53 which stored \*\*\*\* for the fingerprint image data whose dictionary specification means 52 is two or more persons based on the ID number of (1), take out the fingerprint image data of the individual of the ID number concerned, transmit to the memory 54 for collating and store in it.

[0007] (3) In parallel to (2), a collating person places a finger on the photo-sensor section 55. The CCD component 56 reads the fingerprint image of a finger by this, and it changes into the electrical signal of an analog, and the analog-to-digital conversion section 57 changes this analog signal into a digital signal, and stores the fingerprint image data of the same format as dictionary data in the fingerprint image memory 58.

[0008] (4) The fingerprint image data of the collating person who read from the fingerprint image memory 58 is compared with the fingerprint image data of the ID number read from the memory 54 for collating, calculate similarity and whenever [ correlation ], and consider as the collating result O.K. at the time of whenever [ beyond the threshold defined beforehand / the similarity and whenever / correlation ], and the comparison means 59 outputs as a collating result NG, when that is not right.

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[Translation done.]

## \* NOTICES \*

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EFFECT OF THE INVENTION

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[Effect of the Invention] As explained above, according to this invention, the fingerprint image data which the fingerprint collation device 1 took out fingerprint image data dictionary 14 picking based on the ID number read in the non-contact card 2 by non-contact is stored in the memory 15 for collating. Or while storing in the memory 15 for collating the fingerprint image data read in the non-contact card 2 The fingerprint image data read in a collating person's finger is stored in the fingerprint image memory 18. Both fingerprint image data taken out from the memory 15 for these collatings and the fingerprint image memory 18 is compared and collated, and since the configuration which outputs collating result OK/NG is adopted, if fingerprint authentication is performed by easy actuation in which a collating person only lays a finger in the fingerprint read station 16, it can \*\*. Thereby, it is not necessary to perform actuation in which a collating person inputs an ID number from a keyboard etc. like before, or inserts a magnetic card in a card reader, and actuation becomes easy. Moreover, it becomes possible, when advanced security surveillance applies the fingerprint collation device 1 of this invention to the door to the required interior of a room to unlock a door and to enter a room, when an entrance person possesses the non-contact card 2, and performs fingerprint authentication only by laying a finger on the fingerprint read station (fingerprint sensor) 16 installed near the door and it is in agreement.

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[Translation done.]

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MEANS

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[Means for Solving the Problem] Drawing 1 shows the principle block diagram of this invention, and drawing 2 shows other principle block diagrams of this invention.

[0012] In drawing 1 and drawing 2, a fingerprint collation device 1 consists of the fingerprint image data dictionary 14, the memory 15 for collating, a fingerprint read station 16, fingerprint image memory 18, a comparison means 19, etc.

[0013] The fingerprint image data dictionary 14 is a dictionary which matched with the ID number and registered the fingerprint image beforehand. The memory 15 for collating is memory which stores the fingerprint image data for collating.

[0014] The fingerprint image memory 18 is memory which stores the fingerprint image data read by the fingerprint read station 16. The comparison means 19 compares the fingerprint image data taken out from the fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, and judges collating result OK/NG.

[0015] The non-contact card 2 is a card which made an ID number and fingerprint image data hold.

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[Translation done.]

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OPERATION

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[Function] As this invention is shown in drawing 1 , while storing in the memory 15 for collating the fingerprint image data which the fingerprint collation device 1 took out from the fingerprint image data dictionary 14 based on the ID number read in the non-contact card 2 by non-contact. The fingerprint image data read in a collating person's finger is stored in the fingerprint image memory 18, the comparison means 19 compares the fingerprint image data taken out from this fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, and he is trying to output collating result OK/NG.

[0017] Moreover, as shown in drawing 2 , while a fingerprint collation device 1 stores in the memory 15 for collating the fingerprint image data read in the non-contact card 2 by non-contact, the fingerprint image data read in a collating person's finger is stored in the fingerprint image memory 18, the comparison means 19 compares the fingerprint image data taken out from this fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, and he is trying for this invention to output collating result OK/NG.

[0018] Therefore, a collating person does not need to input an ID number from a keyboard etc., or does not need to insert a magnetic card in a card reader, performs fingerprint authentication by easy actuation of only laying a finger in the fingerprint read station 16, and becomes possible [ that unlocking etc. carries out a door ].

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[Translation done.]

## \* NOTICES \*

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EXAMPLE

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[Example] Next, the configuration and actuation of one example of this invention are explained to a detail one by one using drawing 6 from drawing 1.

[0020] Drawing 1 shows the principle block diagram of this invention. This is a block diagram in the case of reading an ID number (identification number) in the non-contact card 2 by non-contact, taking out the fingerprint image data of this ID number from the fingerprint image data dictionary 14, comparing the fingerprint image data of a collating person's finger with this, and judging collating result OK/NG.

[0021] In drawing 1, a fingerprint collation device 1 collates the fingerprint image data taken out from the fingerprint image data dictionary 14, and the fingerprint image data which read the fingerprint of a collating person's finger by the fingerprint read station 16 based on the ID number read in the non-contact card 2, judges collating result OK/NG, and consists of 11 thru/or 19, etc.

[0022] The antenna 11 for non-contact cards is an antenna which calls the non-contact card 2 through radio, is made to send out the ID number etc. through radio, and is received. that the non-contact card control circuit 12 takes out the ID number of the non-contact card 2 from the signal which discharged the electric wave or was received with the antenna 11 for non-contact cards through the antenna 11 for non-contact cards \*\*\*\* -- etc. -- the exchange by the electric wave with the non-contact card 12 is controlled.

[0023] The dictionary specification means 13 pinpoints the dictionary registration location for taking out the fingerprint image data of the finger of the collating person of the ID number concerned from the fingerprint image data dictionary 14 based on the ID number of the non-contact card passed from the non-contact card control circuit 12, and outputs it as dictionary registration positional information.

[0024] The fingerprint image data dictionary 14 is a dictionary which registered the fingerprint image data of a collating person's finger beforehand. The memory 15 for collating is memory which takes out the fingerprint image data corresponding to the ID number read in the non-contact card 2 from the fingerprint image data dictionary 14, and stores it.

[0025] The fingerprint read station 16 reads a fingerprint in a collating person's finger, generates fingerprint image data, and consists of the photo-sensor section 16-1 and a CCD component 16-2.

[0026] The analog-to-digital conversion section 17 changes into digital fingerprint image data the fingerprint image data of the analog of the fingerprint of the finger of the collating person who read by the fingerprint read station 16.

[0027] The fingerprint image memory 18 is memory which stores the digital fingerprint image data after changing by the analog-to-digital conversion section 17. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data corresponding to the ID number taken out from the non-contact card 2, and it outputs the collating result NG noting that it calculates similarity and whenever [ correlation ], and it is in agreement and is not in agreement, when smaller than the collating result O.K. and a predetermined threshold, when larger than a predetermined threshold.

[0028] Next, actuation of the configuration of drawing 1 is explained.

(1) Approach the location in which the collating person held the non-contact card 2, and the fingerprint collation device 1 was installed, and correspond to the call by the electric wave from the antenna 11 for non-contact cards, and the non-contact card 2 puts a self ID number on an electric wave, and sends it out automatically.

[0029] (2) The antenna 11 for non-contact cards receives the electric wave sent out by (1), and the non-contact card control circuit 12 takes out an ID number, and pass the dictionary



specification means 13.

(3) A dictionary specification means 13 by which the ID number was passed by (2) generates the dictionary registration positional information which is the location information which reads the fingerprint image data of the ID number concerned from the fingerprint image data dictionary 14, and inputs it into the fingerprint image data dictionary 14. And the fingerprint image data corresponding to the ID number read from the fingerprint image data dictionary 14 is stored in the memory 15 for collating.

[0030] (4) Lay a finger in the fingerprint read station 16, and read the fingerprint image of a finger by the photo-sensor section 16-1 and the CCD component 16-2 which constitute fingerprint \*\*\*\* 16 concerned, and by the analog-to-digital conversion section 17, a collating person changes the fingerprint image data of an analog into digital fingerprint image data, and stores in the fingerprint image memory 18.

[0031] (5) The comparison means 19 compares the fingerprint image data read in a collating person's finger taken out from the fingerprint image memory 18 with the fingerprint image data corresponding to the ID number taken out from the memory 15 for collating, similarity and whenever [ correlation ] are computed, judge with it being in agreement at the time beyond a predetermined threshold, output the collating result O.K., and output the collating result NG noting that it is not in agreement at the time of below a predetermined threshold.

[0032] As mentioned above, if the location where the collating person possessed the non-contact card 2, and the fingerprint collation device 1 was set up is approached, automatically, the non-contact card 2 sends out an ID number through radio corresponding to the appeal by the electric wave from a fingerprint collation device 1, and stores the fingerprint image data corresponding to this ID number in the memory 15 for collating. Furthermore, if a finger is laid on the fingerprint read station 16 in which a collating person approaches a fingerprint collation device 1, and reads a fingerprint, corresponding to change of the shade of the image by having laid this finger, the fingerprint of a finger is read automatically, and that fingerprint image data is stored in the fingerprint image memory 18. And both are compared and the result is outputted as collating result OK/NG. Thereby, a collating person becomes possible [ performing fingerprint authentication only by easy actuation of laying a finger on the fingerprint read station 16 ].

[0033] Drawing 2 shows other principle block diagrams of this invention. This is a block diagram in the case of reading fingerprint image data in the non-contact card 2 by non-contact, comparing the fingerprint image data of a collating person's finger with this, and judging collating result OK/NG.

[0034] In drawing 2, a fingerprint collation device 1 collates the fingerprint image data read in the non-contact card 2, and the fingerprint image data which read the fingerprint of a collating person's finger by the fingerprint read station 16, judges collating result OK/NG, and consists of 11, 12, 15, 19, etc.

[0035] The antenna 11 for non-contact cards is an antenna which calls the non-contact card 2 through radio, is made to send out the ID number, fingerprint image data, etc. through radio, and is received. that the non-contact card control circuit 12 takes out the fingerprint image data of the non-contact card 2 from the signal which discharged the electric wave or was received with the antenna 11 for non-contact cards through the antenna 11 for non-contact cards \*\*\*\* -- etc. -- the exchange by the electric wave with the non-contact card 12 is controlled.

[0036] The memory 15 for collating is memory which stores the fingerprint image data read in the non-contact card 2. The fingerprint read station 16 reads a fingerprint in a collating person's finger, generates fingerprint image data, and consists of the photo-sensor section 16-1 and a CCD component 16-2.

[0037] The analog-to-digital conversion section 17 changes into digital fingerprint image data the fingerprint image data of the analog of the fingerprint of the finger of the collating person who read by the fingerprint read station 16.

[0038] The fingerprint image memory 18 is memory which stores the digital fingerprint image data after changing by the analog-to-digital conversion section 17. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data read in the non-contact card 2 taken out from the memory 15 for collating, and it outputs the collating result NG noting that it calculates similarity and whenever [ correlation ], and it is in agreement and is not in agreement, when smaller than the collating result O.K. and a predetermined threshold, when larger than a predetermined threshold.

[0039] Next, actuation of the configuration of drawing 2 is explained.

(1) Approach the location in which the collating person held the non-contact card 2, and the fingerprint collation device 1 was installed, correspond to the call by the electric wave from the antenna 11 for non-contact cards, put the fingerprint image data which the non-contact card 2 holds on an electric wave, and send it out automatically.

[0040] (2) The antenna 11 for non-contact cards receives the electric wave sent out by (1), and the non-contact card control circuit 12 takes out fingerprint image data, and store in the memory 15 for collating.

[0041] (3) Lay a finger in the fingerprint read station 16, and read the fingerprint image of a finger by the photo-sensor section 16-1 and the CCD component 16-2 which constitute fingerprint \*\*\*\* 16 concerned, and by the analog-to-digital conversion section 17, a collating person changes the fingerprint image data of an analog into digital fingerprint image data, and stores in the fingerprint image memory 18.

[0042] (4) The comparison means 19 compares the fingerprint image data read in a collating person's finger taken out from the fingerprint image memory 18 with the fingerprint image data taken out from the memory 15 for collating, similarity and whenever [ correlation ] are computed, judge with it being in agreement at the time beyond a predetermined threshold, output the collating result O.K., and output the collating result NG noting that it is not in agreement at the time of below a predetermined threshold.

[0043] As mentioned above, if the location where the collating person possessed the non-contact card 2, and the fingerprint collation device 1 was set up is approached, automatically, the non-contact card 2 sends out fingerprint image data through radio corresponding to the appeal by the electric wave from a fingerprint collation device 1, and stores this fingerprint image data in the memory 15 for collating. Furthermore, if a finger is laid on the fingerprint read station 16 in which a collating person approaches a fingerprint collation device 1, and reads a fingerprint, corresponding to change of the shade of the image by having laid this finger, the fingerprint of a finger is read automatically, and that fingerprint image data is stored in the fingerprint image memory 18. And both are compared and the result is outputted as collating result OK/NG. Thereby, a collating person becomes possible [ performing fingerprint authentication only by easy actuation of laying a finger on the fingerprint read station 16 ].

[0044] Drawing 3 shows 1 example block diagram of this invention. This is the example configuration of the configuration of drawing 1, and is a thing at the time of notifying collating result OK/NG from the comparison means 19 to the door control section 20 and a display and control section 22. It explains below.

[0045] In drawing 3, corresponding to the collating result O.K. from the comparison means 19, supply an unlocking signal to the electric lock 21, and it unlocks, or the door control section 20 supplies and carries out the closed lock of the closed lock signal to the electric lock 21.

[0046] The electric lock 21 is an electric lock installed in the door which carries out close recession. A display and control section 22 displays a message on a display 23 corresponding to collating result OK/NG from the comparison means 19. For example, when a finger is laid upwards at the fingerprint read station 16, without detecting "a room cannot be entered" and the non-contact card 2 corresponding to the collating result NG, a message with the "required" card for entrance into a room is displayed.

[0047] that an indicating equipment 23 displays a message \*\*\*\* -- etc. -- it carries out. Next, actuation of the configuration of drawing 3 is explained to a detail using the flow chart of drawing 4. In drawing 4, the non-contact card 1 with which a collating person possesses a call by the electric wave receives S1 from a fingerprint collation device 1. A collating person possesses the non-contact card 2, this approaches the location in which the fingerprint collation device 1 is installed, and the non-contact card 2 receives the call by the electric wave discharged from the antenna 11 for non-contact cards of a fingerprint collation device 1.

[0048] S2 transmits through radio the ID number of self [ card / 2 / which received the call through radio by S1 / non-contact ]. S3 searches a dictionary. This takes out an ID number out of the signal which the antenna 11 for non-contact cards of a fingerprint collation device 1 received the ID number transmitted by S2, and the non-contact card control circuit 12 received, generates delivery and dictionary registration positional information for the dictionary specification means 13, and searches and takes out the fingerprint image data of an ID number from the fingerprint image data dictionary 14 based on this.

[0049] S4 stores fingerprint image data in the memory 15 for collating. This stores in the memory 15 for collating the fingerprint image data of the ID number taken out from the

fingerprint image data dictionary 14 by S3.

[0050] S5 distinguishes whether it is fingerprint detection. This distinguishes whether a collating person's finger was laid, and whether the fingerprint read station 16 became [ the shade of distinction and the image read by the fingerprint read station 16 when saying concretely ] larger than a predetermined threshold in parallel to processing of S1 thru/or S4. Since the fingerprint image of a collating person's finger was detected in YES, it progresses to S6. S5 is repeated and it stands by by carrying out in NO.

[0051] Since the fingerprint image of a collating person's finger was detected by YES of S5, S6 changes into the fingerprint image data of TEJITARU the fingerprint image read by the photo-sensor section 16-1 and the CCD component 16-2 which constitute the fingerprint read station 16 by the analog-to-digital conversion section 17, and stores it in the fingerprint image memory 18.

[0052] S7 collates and distinguishes whether it is coincidence. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data (fingerprint image data read from the fingerprint image data dictionary 14 based on the ID number read in the non-contact card 2) taken out from the memory 15 for collating, and this distinguishes whether it is coincidence in quest of similarity and whenever [ correlation ] above a predetermined threshold. In YES, the notice of unlocking is performed to the door control section 20 by S8, the electric lock 21 is changed into an open condition, and a collating person enters the room. On the other hand, in not being in agreement, it carries out repeatedly from the beginning.

[0053] Drawing 5 shows the example of installation of the equipment of this invention. This is the example which attached drawing 3 and the drawing 6 fingerprint collation device 1. Actuation is explained.

\*\* A collating person is going to possess the non-contact card 2, walk along a path, and an advanced security management tends to enter the required interior of a room.

[0054] \*\* Go into the effective area of an electric wave where the antenna 11 for non-contact cards was discharged. The fingerprint image data which the non-contact card 2 which a collating person possesses in this condition corresponding to the call discharged from the antenna 11 for non-contact cards sent out the self ID number (or fingerprint image data) through radio automatically, and took out from the fingerprint image data dictionary 14 based on the ID number which received is stored in the memory 15 for collating (or fingerprint image data which received memory 15 for collating storing).

[0055] \*\* A collating person lays a finger on the fingerprint read station (fingerprint sensor) 16, and stores in the fingerprint image memory 18 the fingerprint image data which read the fingerprint image. And both fingerprint image data is compared, when in agreement, the door of electric lock control is opened, and a security management with an advanced collating person goes into the required interior of a room.

[0056] Drawing 6 shows other example block diagrams of this invention. This is the example configuration of the configuration of drawing 2, and is a thing at the time of notifying collating result OK/NG from the comparison means 19 to the door control section 20 and a display and control section 22. Moreover, since the door control section 20, the electric lock 21, the display and control section 22, and the display 23 are the same as that of the thing of drawing 3, explanation is omitted.

[0057] Next, actuation is explained with reference to the flow chart of drawing 4. Here, S12 is processed instead of S2 and S3 of drawing 4. The non-contact card 1 with which a collating person possesses a call receives S1 from a fingerprint collation device 1 by the electric wave. A collating person possesses the non-contact card 2, this approaches the location in which the fingerprint collation device 1 is installed, and non-contact card \*\* 2 receives the call discharged from the antenna 11 for non-contact cards of a fingerprint collation device 1.

[0058] S12 transmits through radio the fingerprint image data which the non-contact card 2 which received the call through radio by S1 holds. S4 stores fingerprint image data in the memory 15 for collating. This stores in the memory 15 for collating the fingerprint image data read in the non-contact card 2 by S12.

[0059] S5 distinguishes whether it is fingerprint detection. It distinguishes whether in parallel to processing of S1, S12, and S4, as for this, a collating person's finger was laid for the fingerprint read station 16. Since the fingerprint image of a collating person's finger was detected in YES, it progresses to S6. S5 is repeated and it stands by by carrying out in NO.

[0060] Since the fingerprint image of a collating person's finger was detected by YES of S5, S6 stores the read fingerprint image data in the fingerprint image memory 18. S7 collates and distinguishes whether it is coincidence. The comparison means 19 compares the fingerprint image data of the finger of the collating person who took out from the fingerprint image memory 18 with the fingerprint image data (fingerprint image data read in the non-contact card 2) taken out from the memory 15 for collating, and this distinguishes whether it is coincidence in quest of similarity and whenever [ correlation ] above a predetermined threshold. In YES, the notice of unlocking is performed to the door control section 20 by S8, the electric lock 21 is changed into an open condition, and a collating person enters the room. On the other hand, in not being in agreement, it carries out repeatedly from the beginning.

[0061] In addition, since it is necessary to register the fingerprint image data dictionary 14 beforehand into a fingerprint collation device 1 since the ID number is read in the non-contact card 2 by non-contact, and fingerprint image data is kept at the fingerprint collation device 1 side, the configuration of drawing 1 and drawing 3 has high security, and it is suitable [ configuration ] when managing receipts and payments of one specific facility etc.

[0062] On the other hand, since fingerprint image data is read in the non-contact card 2 by non-contact, the configuration of drawing 2 and drawing 6 does not need to register the fingerprint image data dictionary 14 beforehand into a fingerprint collation device 1, and it is suitable [ configuration ] when managing receipts and payments of the dispersed facility etc.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the principle block diagram of this invention.

[Drawing 2] They are other principle block diagrams of this invention.

[Drawing 3] It is 1 example block diagram of this invention of this invention.

[Drawing 4] It is the explanation flow chart of this invention of operation.

[Drawing 5] It is the example of installation of the equipment of this invention.

[Drawing 6] They are other example block diagrams of this invention.

[Drawing 7] It is the explanatory view of the conventional technique.

[Description of Notations]

- 1: Fingerprint collation device
- 11: The antenna for non-contact cards
- 12: Non-contact card control circuit
- 13: Dictionary specification means
- 14: Fingerprint image data dictionary
- 15: Memory for collating
- 16: Fingerprint read station (fingerprint sensor)
- 16-1: Photo sensor
- 16-2: CCD component
- 17: Analog-to-digital conversion section
- 18: Fingerprint image memory
- 19: Comparison means
- 20: Door control section
- 21: An electric lock
- 22: Display and control section
- 23: Display

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[Translation done.]

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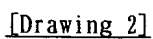
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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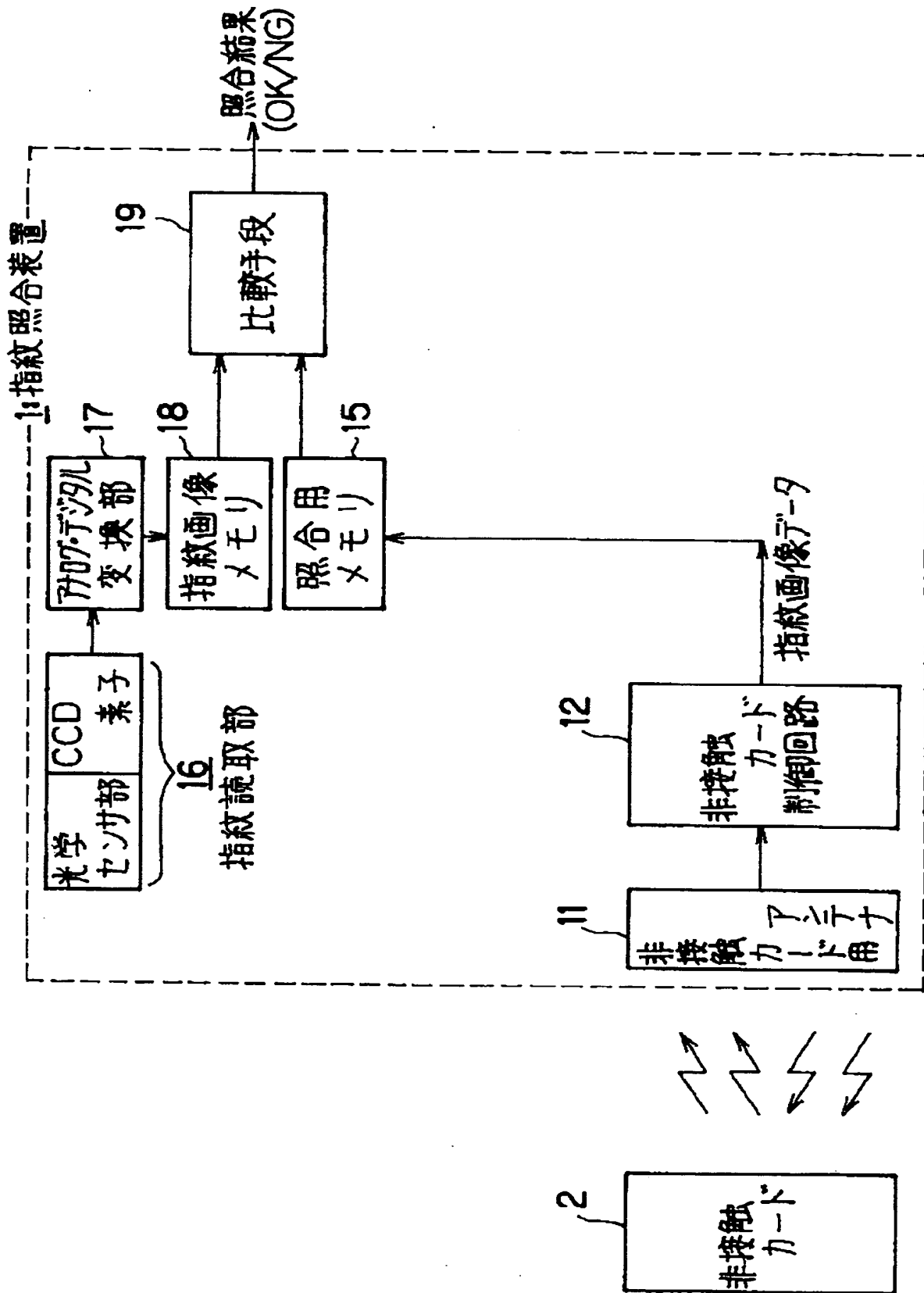
DRAWINGS

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[Drawing 1]



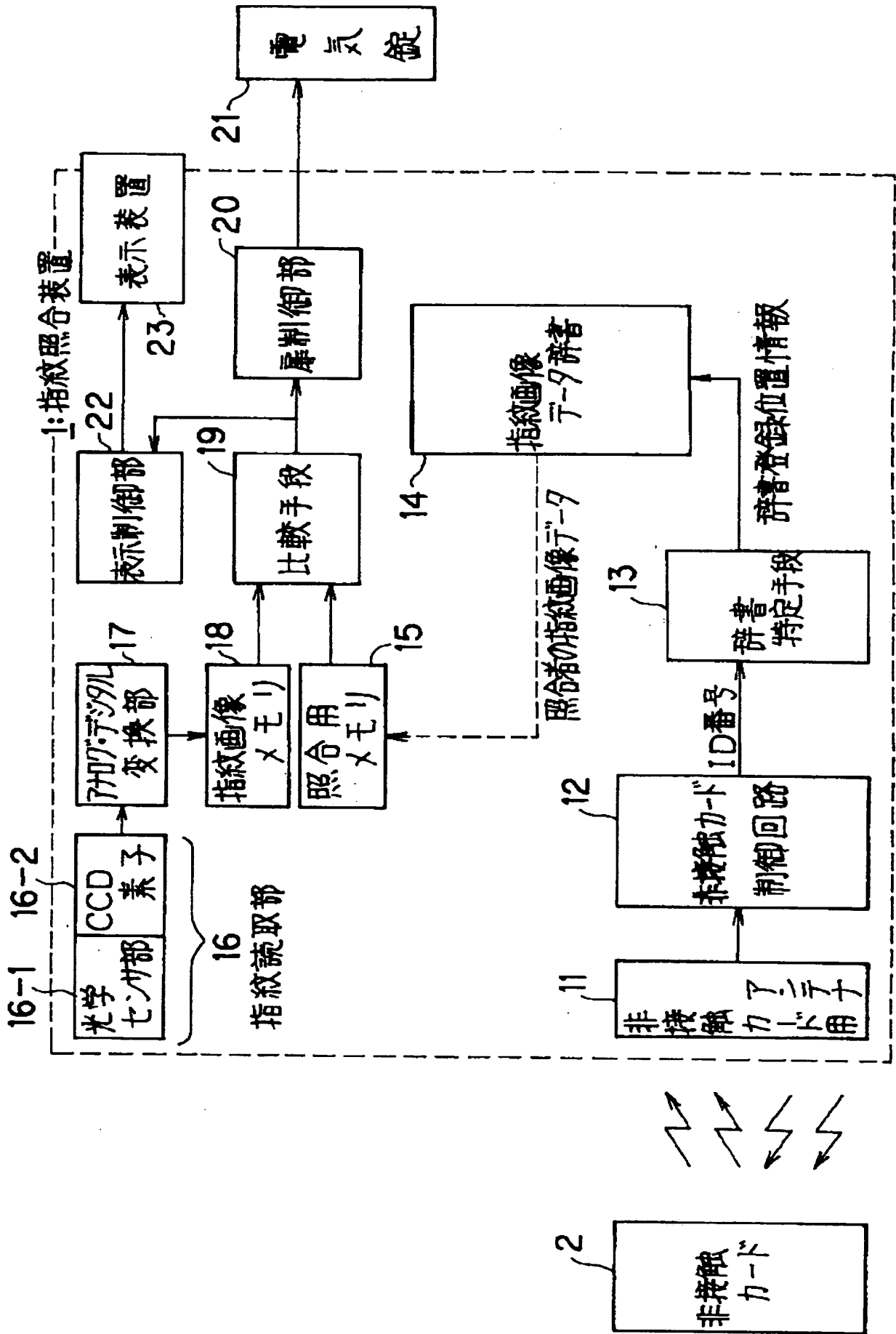
本発明の他の原理ブロック図



[Drawing 3]

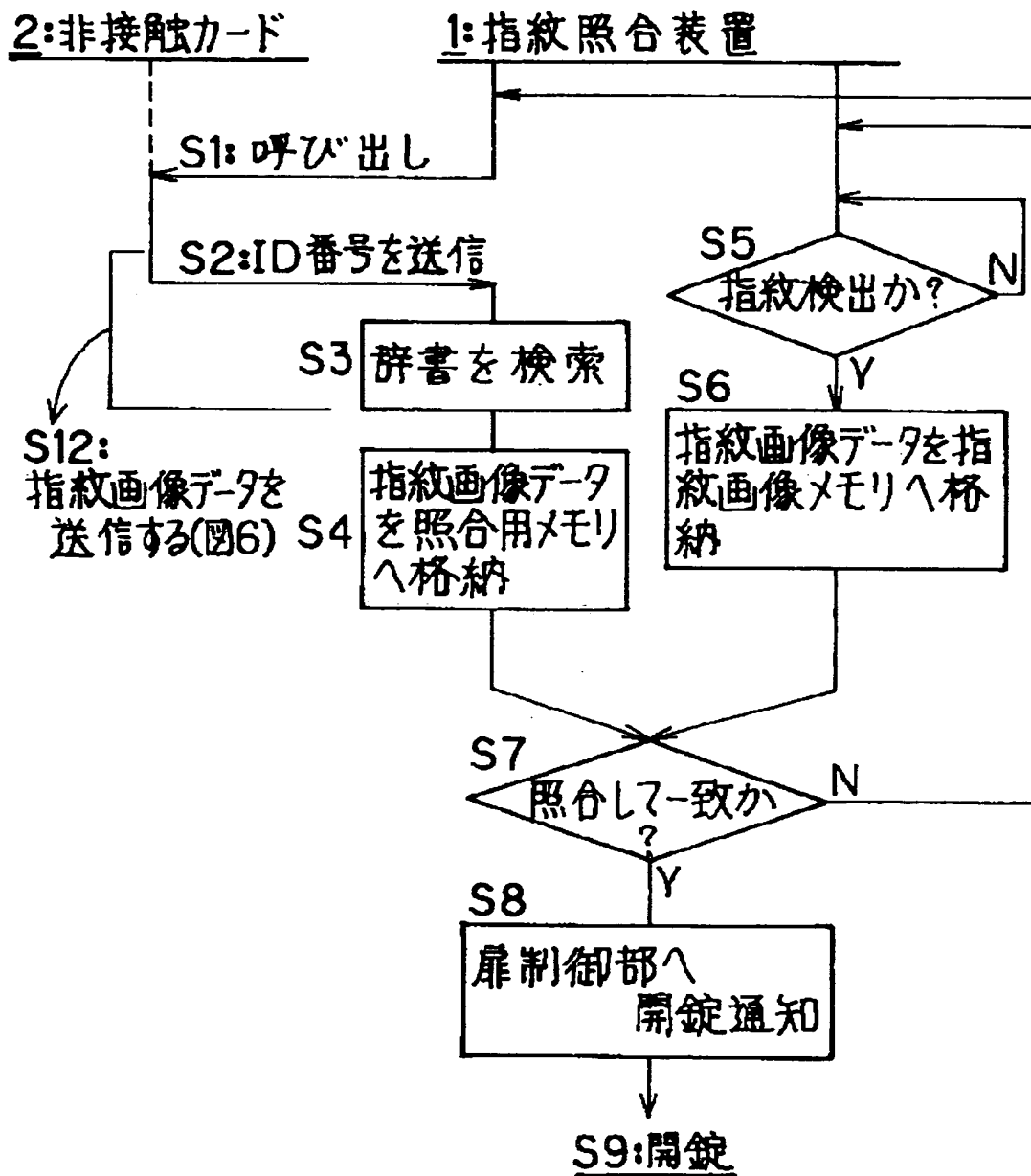


本発明の1実施例構成図



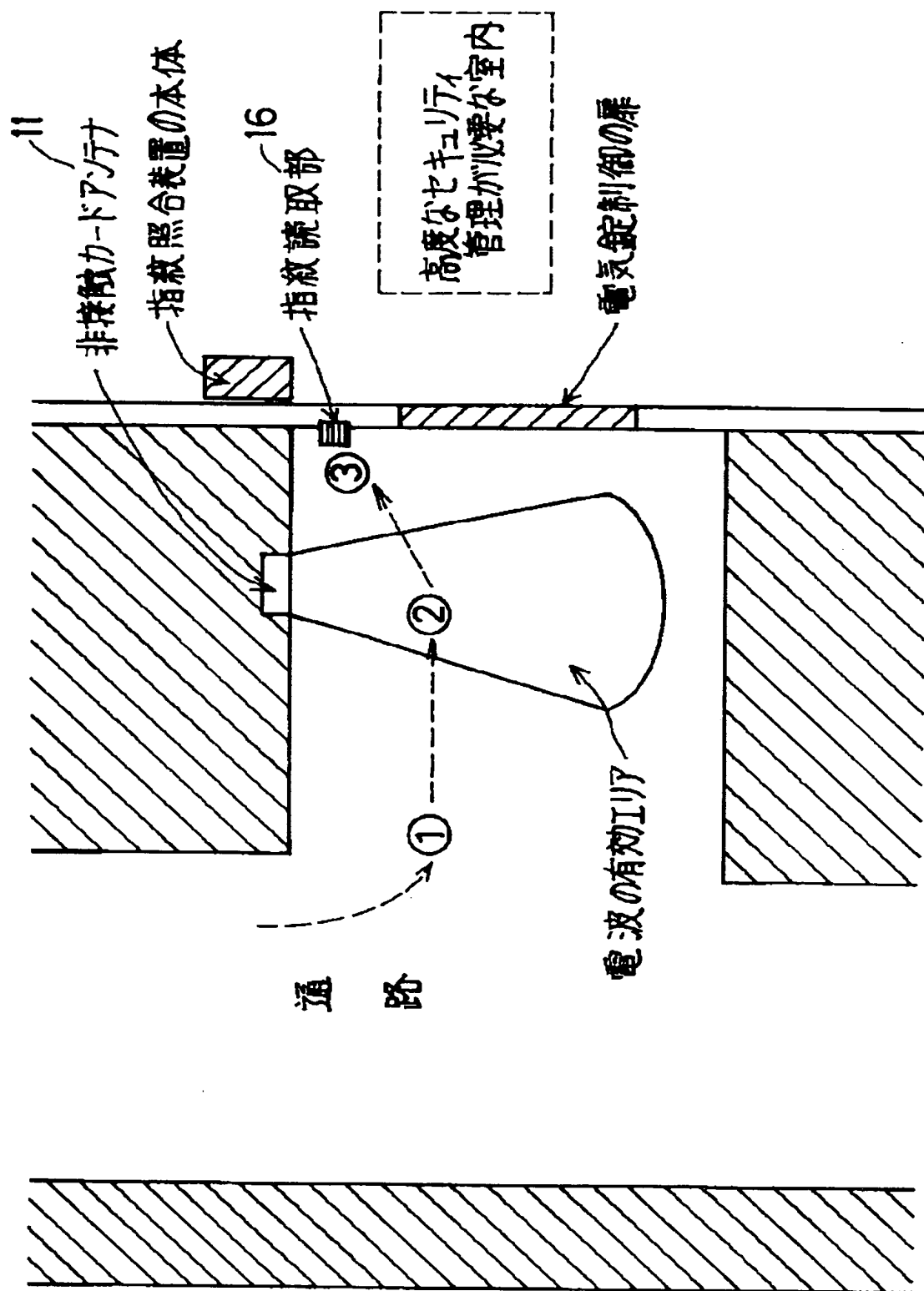
[Drawing 4]

## 本発明の動作説明フローチャート



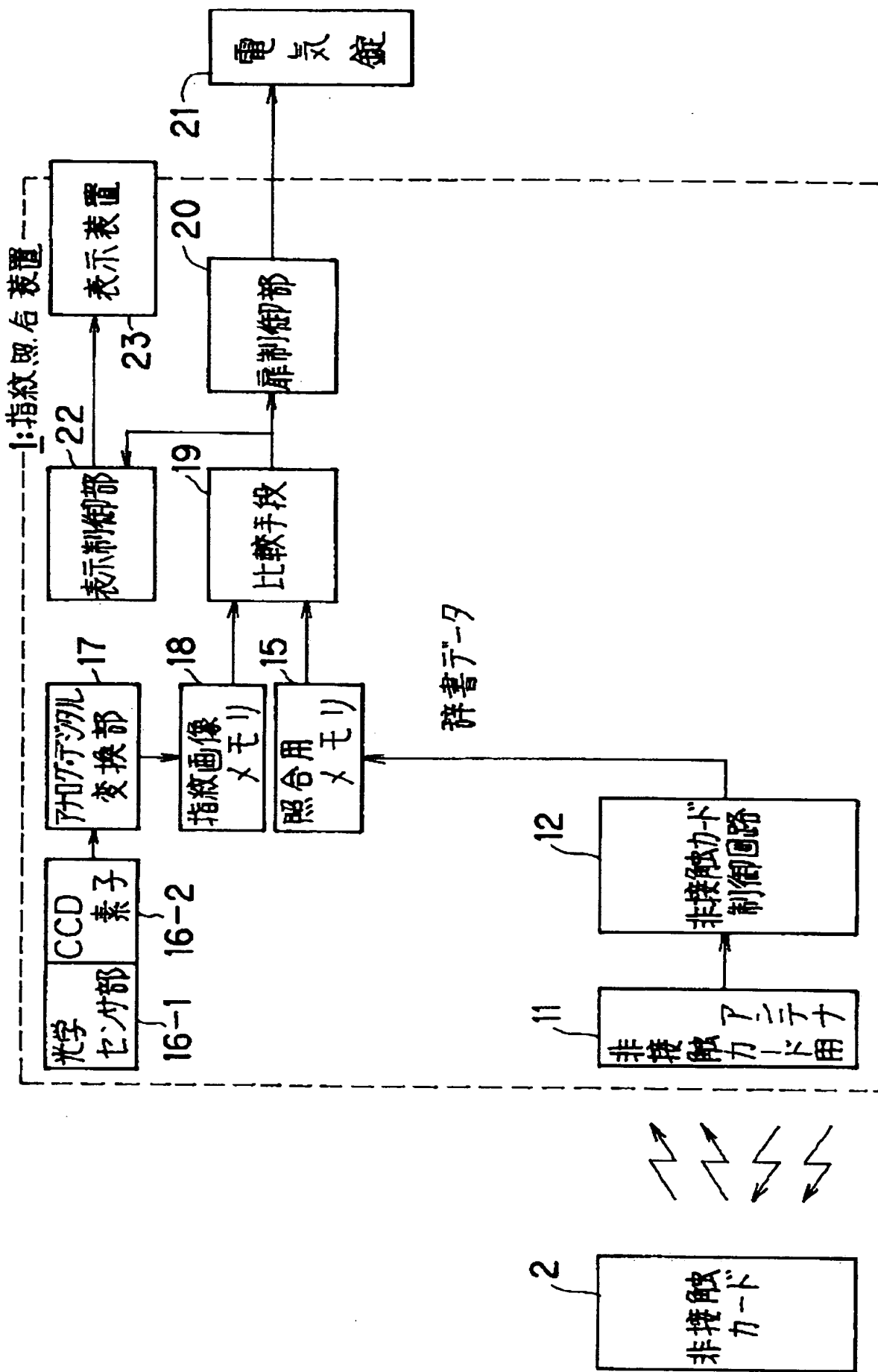
[Drawing 5]

# 本発明の装置の取り付け例



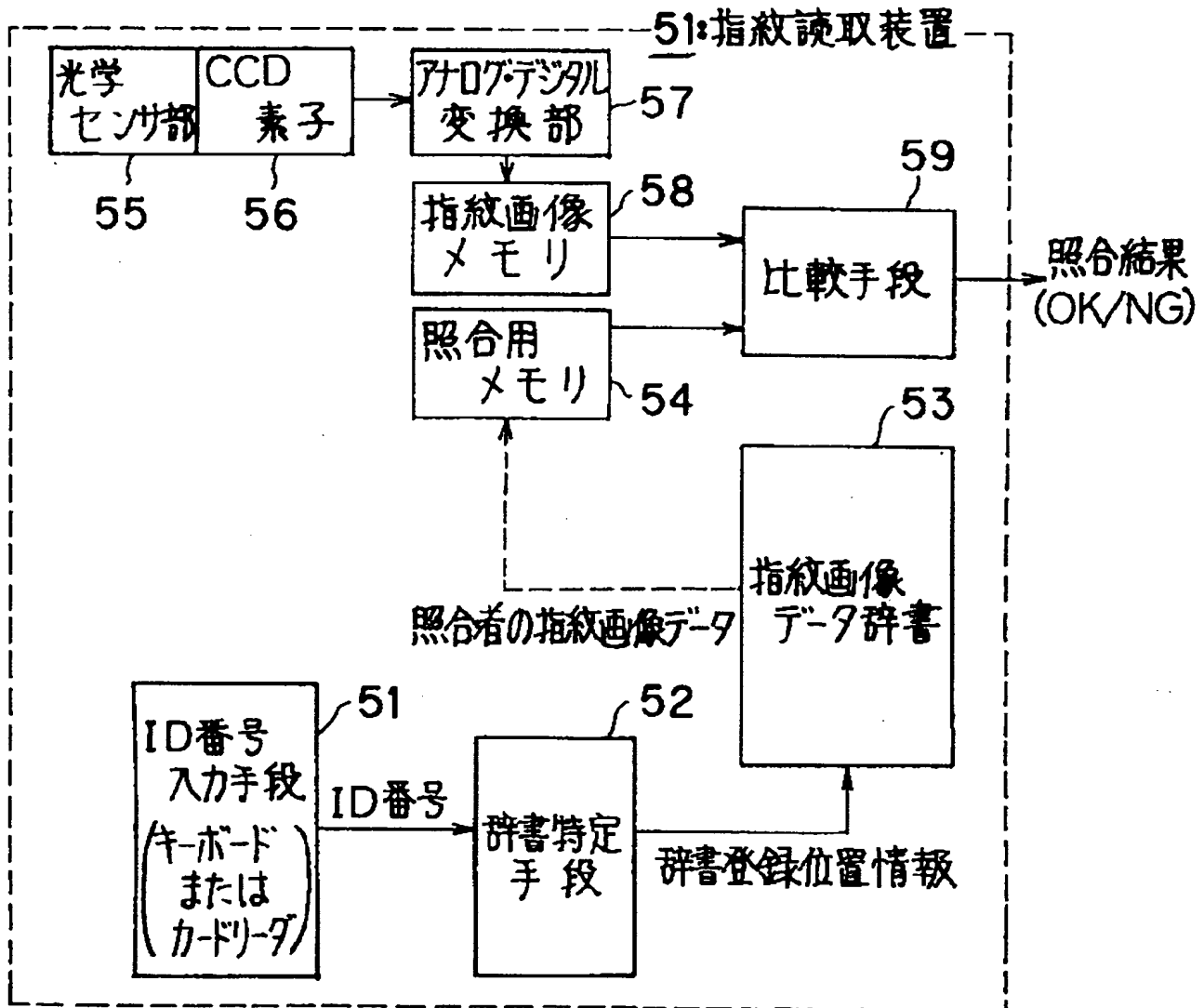
[Drawing 6]

本発明の他の実施例構成図



[Drawing 7]

## 従来技術の説明図



[Translation done.]

(19)日本国特許庁(JP)

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(11)特許出願公開番号

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(43)公開日 平成5年(1993)2月26日

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G 0 6 F 15/62	4 6 0	9071-5L		
G 0 6 K 17/00	V	8623-5L		

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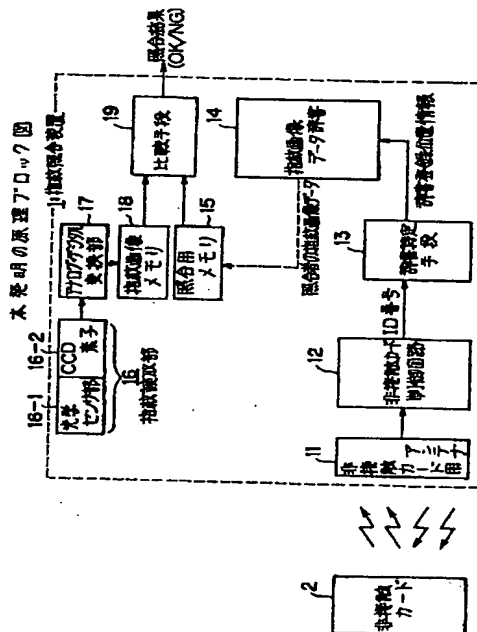
最終頁に続く

(54)【発明の名称】 指紋照合装置

(57)【要約】

【目的】 本発明は、指紋照合装置に関し、テンキーなどによるID番号の入力や磁気カードの挿入などの操作を行うことなく、照合者の指の指紋画像データとの指紋照合を行い、簡単な操作によって指紋照合を可能にすることを目的とする。

【構成】 指紋読取部16と、指紋画像メモリ18と、指紋画像データ辞書14と、照合用メモリ15とを設けた指紋照合装置1と、ID番号を保持する非接触カード2とを備え、指紋照合装置1が非接触カード2から非接触で読み取ったID番号をもとに指紋画像データ辞書14ら取り出した指紋画像データを照合用メモリ15に格納すると共に、照合者の指から読み取った指紋画像データを指紋画像メモリ18に格納し、これら両者の指紋画像データとを照合し、照合結果OK/NGを出力するように構成する。



## 【特許請求の範囲】

【請求項1】 指紋を読み取って照合する指紋照合装置において、

指紋を読み取る指紋読取部(16)と、

この指紋読取部(16)が読み取った指紋画像データを格納する指紋画像メモリ(18)と、

ID番号に対応づけて指紋画像データを予め登録した指紋画像データ辞書(14)と、

非接触カード(2)から非接触で読み取ったID番号をもとに上記指紋画像データ辞書(14)から読み出した指紋画像データを格納する照合用メモリ(15)とを設けた指紋照合装置(1)と、

ID番号を保持する非接触カード(2)とを備え、

指紋照合装置(1)が上記非接触カード(2)から非接触で読み取ったID番号をもとに上記指紋画像データ辞書(14)から取り出した指紋画像データを上記照合用メモリ(15)に格納すると共に、照合者の指から読み取った指紋画像データを上記指紋画像メモリ(18)に格納し、この指紋画像メモリ(18)から読み出した指紋画像データと上記照合用メモリ(15)から読み出した指紋画像データとを照合し、照合結果OK/NGを出力するように構成したことを特徴とする指紋照合装置。

【請求項2】 指紋を読み取って照合する指紋照合装置において、

指紋を読み取る指紋読取部(16)と、

この指紋読取部(16)が読み取った指紋画像データを格納する指紋画像メモリ(18)と、

非接触カード(2)から非接触で読み取った指紋画像データを格納する照合用メモリ(15)とを設けた指紋照合装置(1)と、

指紋画像データを保持する非接触カード(2)とを備え、

指紋照合装置(1)が上記非接触カード(2)から非接触で読み取った指紋画像データを上記照合用メモリ(15)に格納すると共に、照合者の指から読み取った指紋画像データを上記指紋画像メモリ(18)に格納し、この指紋画像メモリ(18)から読み出した指紋画像データと上記照合用メモリ(15)から読み出した指紋画像データとを照合し、照合結果OK/NGを出力するように構成したことを特徴とする指紋照合装置。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、指紋を読み取って照合する指紋照合装置に関するものである。計算機室や高度のセキュリティが要求される施設への入室・入場や、端末機利用や金銭の扱いに関する場合の本人確認の手段として、これまで用いられてきたIDカードには、紛失・盗難・偽造の恐れがある。また、暗証番号なども誕生日や電話番号などから容易に類推されるなど、セキュリティ確保の面から多くの問題が指摘されている。

【0002】 指紋は、「万人不同」、「終生不変」という2大特徴を持ち、指紋を本人確認の手段として用いる指紋照合技術は、他の個人照合技術である掌形、網膜、音声などに比べ最も有力な手段と考えられている。

【0003】 磁気カードやICカードによる本人確認は、カードそのものの正当性をチェックしているにすぎず、その所有者が正当であるかのチェックはしていないのに対して、指紋照合は本人そのものであるかどうかを確認しているという点が大きく異なる。このため、現在では、指紋照合装置は高度なセキュリティが要求される場所への入退室、端末の使用権の確認などに使用されているが、その操作性が悪く、より使い易くすることが望まれている。

## 【0004】

【従来の技術】 従来、指紋照合装置は、図7に示すような構成を持ち、指紋センサ(光学センサ部55とCCD素子56)により取り込んだ指紋画像データと、キーボードからID番号(識別番号)をキー入力、あるいは磁気カード、ICカードなどでID番号をカードリーダーによって読み込ませ、このID番号によって指紋画像データ辞書53から取り出した指紋画像データとの比較を行い、本人か否かを判定するようにしていた。以下図7の構成の動作を簡単に説明する。

【0005】 (1) 照合者がID番号入力手段51であるキーボードからID番号をキー入力したり、あるいは磁気カードをカードリーダーによってID番号を読み取らせたりする。

【0006】 (2) (1)のID番号をもとに、辞書特定手段52が複数人分の指紋画像データを予め格納した指紋画像データ辞書53の場所を求め、当該ID番号の個人の指紋画像データを取り出して照合用メモリ54に転送し、格納する。

【0007】 (3) (2)に並行して、照合者が指を光学センサ部55上に置く。これによりCCD素子56が指の指紋画像を読み取ってアナログの電気信号に変換し、アナログ・デジタル変換部57がこのアナログ信号をデジタル信号に変換し、辞書データと同一の形式の指紋画像データを指紋画像メモリ58に格納する。

【0008】 (4) 比較手段59が、指紋画像メモリ58から読み出した照合者の指紋画像データと、照合用メモリ54から読み出したID番号の指紋画像データとを比較し、類似度・相関度を計算し、予め定めた閾値以上の類似度・相関度のときに照合結果OKとし、そうでないときに照合結果NGとして出力する。

## 【0009】

【発明が解決しようとする課題】 従来の図7の指紋照合装置51は、上述したように、照合開始時に、先ずID番号入力手段51である例えばキーボードから照合者個人を特定するID番号(識別番号)を入力するか、あるいは磁気カード、ICカードなどの携帯可能な記憶媒体

に予め記録したID番号をカードリーダなどで読み取らせ、これをもとに指紋画像データ辞書53から照合者の指紋の指紋画像データを取り出す。次に、照合者の実際の指から読み取った指紋画像データとを比較し、照合結果OK/NGを判定していたため、照合者にとって、ID番号を入力すること、および光学センサ部55上に指を載置することという2段階の操作を強要されてしまい、大きな負担で使いづらいという問題があった。また、照合者のID番号の入力をなくすため、照合者の指から読み取った実際の指紋画像データをもとに、指紋画像データ辞書53中から登録されている指紋画像データと1つ1つ比較して類似度・相関度を計算して判定していたのでは、登録されている指紋画像データの数が多くなった場合、判定処理のための時間が多く必要となり、現実的でないという問題があった。

【0010】本発明は、テンキーなどによるID番号の入力や磁気カードの挿入などの操作を行うことなく、非接触カードから照合者のID番号（あるいは指紋画像データ）を非接触で読み取って照合者の指の指紋画像データとの指紋照合を行い、簡単な操作によって指紋照合を可能にすることを目的としている。

【0011】

【課題を解決するための手段】図1は本発明の原理ブロック図を示し、図2は本発明の他の原理ブロック図を示す。

【0012】図1および図2において、指紋照合装置1は、指紋画像データ辞書14、照合用メモリ15、指紋読取部16、指紋画像メモリ18、比較手段19などから構成されるものである。

【0013】指紋画像データ辞書14は、ID番号に対応づけて指紋画像を予め登録した辞書である。照合用メモリ15は、照合用の指紋画像データを格納するメモリである。

【0014】指紋画像メモリ18は、指紋読取部16によって読み取った指紋画像データを格納するメモリである。比較手段19は、指紋画像メモリ18から取り出した指紋画像データと、照合用メモリ15から取り出した指紋画像データとを比較し、照合結果OK/NGを判定するものである。

【0015】非接触カード2は、ID番号や指紋画像データを保持させたカードである。

【0016】

【作用】本発明は、図1に示すように、指紋照合装置1が非接触カード2から非接触で読み取ったID番号をもとに指紋画像データ辞書14から取り出した指紋画像データを照合用メモリ15に格納すると共に、照合者の指から読み取った指紋画像データを指紋画像メモリ18に格納し、この指紋画像メモリ18から取り出した指紋画像データと照合用メモリ15から取り出した指紋画像データとを比較手段19が比較し、照合結果OK/NGを

出力するようにしている。

【0017】また、本発明は、図2に示すように、指紋照合装置1が非接触カード2から非接触で読み取った指紋画像データを照合用メモリ15に格納すると共に、照合者の指から読み取った指紋画像データを指紋画像メモリ18に格納し、この指紋画像メモリ18から取り出した指紋画像データと照合用メモリ15から取り出した指紋画像データとを比較手段19が比較し、照合結果OK/NGを出力するようにしている。

【0018】従って、照合者がID番号をキーボードなどから入力したり、磁気カードをカードリーダに挿入したりする必要がなく、単に指を指紋読取部16に載置するという簡単な操作で指紋照合を行い、扉を開錠などすることが可能となる。

【0019】

【実施例】次に、図1から図6を用いて本発明の1実施例の構成および動作を順次詳細に説明する。

【0020】図1は、本発明の原理ブロック図を示す。これは、非接触カード2から非接触でID番号（識別番号）を読み取り、指紋画像データ辞書14からこのID番号の指紋画像データを取り出し、照合者の指の指紋画像データとこれを比較して照合結果OK/NGを判定する場合のブロック図である。

【0021】図1において、指紋照合装置1は、非接触カード2から読み取ったID番号をもとに指紋画像データ辞書14から取り出した指紋画像データと、照合者の指の指紋を指紋読取部16によって読み取った指紋画像データとを照合して照合結果OK/NGを判定するものであって、11ないし19などから構成されるものである。

【0022】非接触カード用アンテナ11は、電波で非接触カード2を呼び出し、そのID番号などを電波で送出させ、受信するアンテナである。非接触カード制御回路12は、非接触カード用アンテナ11を介して電波を発射したり、非接触カード用アンテナ11によって受信した信号から非接触カード2のID番号を取り出したりなど、非接触カード12との電波によるやりとりを制御するものである。

【0023】辞書特定手段13は、非接触カード制御回路12から渡された非接触カードのID番号をもとに、指紋画像データ辞書14から当該ID番号の照合者の指の指紋画像データを取り出すための辞書登録位置を特定し、辞書登録位置情報として出力するものである。

【0024】指紋画像データ辞書14は、照合者の指の指紋画像データを予め登録した辞書である。照合用メモリ15は、非接触カード2から読み取ったID番号に対応する指紋画像データを指紋画像データ辞書14から取り出して格納するメモリである。

【0025】指紋読取部16は、照合者の指から指紋を読み取り、指紋画像データを生成するものであって、光学



センサ部16-1およびCCD素子16-2から構成されるものである。

【0026】アナログ・デジタル変換部17は、指紋読取部16によって読み取った照合者の指の指紋のアナログの指紋画像データを、デジタルの指紋画像データに変換するものである。

【0027】指紋画像メモリ18は、アナログ・デジタル変換部17によって変換した後のデジタルの指紋画像データを格納するメモリである。比較手段19は、指紋画像メモリ18から取り出した照合者の指の指紋画像データと、非接触カード2から取り出したID番号に対応する指紋画像データとを比較し、類似度・相関度を計算して所定閾値よりも大きいときに一致するとして照合結果OK、所定閾値よりも小さいときに一致しないとして照合結果NGを出力するものである。

【0028】次に、図1の構成の動作を説明する。

(1) 照合者が非接触カード2を保持して指紋照合装置1が設置された場所に近づき、非接触カード用アンテナ11からの電波による呼び出しに対応し、非接触カード2が自己のID番号を電波に載せて自動的に送出する。

【0029】(2) (1)で送出されてきた電波を非接触カード用アンテナ11で受信し、非接触カード制御回路12がID番号を取り出し、辞書特定手段13に渡す。

(3) (2)でID番号を渡された辞書特定手段13は、指紋画像データ辞書14から当該ID番号の指紋画像データを読み出す場所情報である辞書登録位置情報を生成し、指紋画像データ辞書14に入力する。そして、指紋画像データ辞書14から読み出したID番号に対応する指紋画像データを照合用メモリ15に格納する。

【0030】(4) 照合者が指を指紋読取部16に配置し、当該指紋読取部16を構成する光学センサ部16-1およびCCD素子16-2によって指の指紋画像を読み取り、アナログ・デジタル変換部17によってアナログの指紋画像データをデジタルの指紋画像データに変換し、指紋画像メモリ18に格納する。

【0031】(5) 比較手段19が、指紋画像メモリ18から取り出した照合者の指から読み取った指紋画像データと、照合用メモリ15から取り出したID番号に対応する指紋画像データとを比較し、類似度・相関度を算出して所定閾値以上のときに一致すると判定して照合結果OKを出力し、所定閾値以下のときに一致しないとして照合結果NGを出力する。

【0032】以上のように、照合者が非接触カード2を所持して指紋照合装置1が設定された場所に近づくと、自動的に非接触カード2が指紋照合装置1からの電波による呼びかけに対応してID番号を電波で送出し、このID番号に対応する指紋画像データを照合用メモリ15に格納する。更に、照合者が指紋照合装置1に近づき指

紋を読み取る指紋読取部16上に指を載置すると、この指を載置したことによる画像の濃淡の変化に対応して自動的に指の指紋を読み取り、その指紋画像データを指紋画像メモリ18に格納する。そして、両者を比較してその結果を照合結果OK/NGとして出力する。これにより、照合者は指を指紋読取部16上に載置するという簡単な操作のみで指紋照合を行うことが可能となる。

【0033】図2は、本発明の他の原理ブロック図を示す。これは、非接触カード2から非接触で指紋画像データを読み取り、照合者の指の指紋画像データとこれを比較して照合結果OK/NGを判定する場合のブロック図である。

【0034】図2において、指紋照合装置1は、非接触カード2から読み取った指紋画像データと、照合者の指の指紋を指紋読取部16によって読み取った指紋画像データとを照合して照合結果OK/NGを判定するものであって、11、12、15ないし19などから構成されるものである。

【0035】非接触カード用アンテナ11は、電波で非接触カード2を呼び出し、そのID番号、指紋画像データなどを電波で送出させ、受信するアンテナである。非接触カード制御回路12は、非接触カード用アンテナ11を介して電波を発射したり、非接触カード用アンテナ11によって受信した信号から非接触カード2の指紋画像データを取り出したりなど、非接触カード12との電波によるやりとりを制御するものである。

【0036】照合用メモリ15は、非接触カード2から読み取った指紋画像データを格納するメモリである。指紋読取部16は、照合者の指から指紋を読み取り、指紋画像データを生成するものであって、光学センサ部16-1およびCCD素子16-2から構成されるものである。

【0037】アナログ・デジタル変換部17は、指紋読取部16によって読み取った照合者の指の指紋のアナログの指紋画像データを、デジタルの指紋画像データに変換するものである。

【0038】指紋画像メモリ18は、アナログ・デジタル変換部17によって変換した後のデジタルの指紋画像データを格納するメモリである。比較手段19は、指紋画像メモリ18から取り出した照合者の指の指紋画像データと、照合用メモリ15から取り出した非接触カード2から読み取った指紋画像データとを比較し、類似度・相関度を計算して所定閾値よりも大きいときに一致するとして照合結果OK、所定閾値よりも小さいときに一致しないとして照合結果NGを出力するものである。

【0039】次に、図2の構成の動作を説明する。

(1) 照合者が非接触カード2を保持して指紋照合装置1が設置された場所に近づき、非接触カード用アンテナ11からの電波による呼び出しに対応し、非接触カード2が保持する指紋画像データを電波に載せて自動的に

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送出する。

【0040】(2) (1)で送出されてきた電波を非接触カード用アンテナ11で受信し、非接触カード制御回路12が指紋画像データを取り出し、照合用メモリ15に格納する。

【0041】(3) 照合者が指を指紋読取部16に載置し、当該指紋読取部16を構成する光学センサ部16-1およびCCD素子16-2によって指の指紋画像を読み取り、アナログ・デジタル変換部17によってアナログの指紋画像データをデジタルの指紋画像データに変換し、指紋画像メモリ18に格納する。

【0042】(4) 比較手段19が、指紋画像メモリ18から取り出した照合者の指から読み取った指紋画像データと、照合用メモリ15から取り出した指紋画像データとを比較し、類似度・相関度を算出して所定閾値以上のときに一致すると判定して照合結果OKを出力し、所定閾値以下のときに一致しないとして照合結果NGを出力する。

【0043】以上のように、照合者が非接触カード2を所持して指紋照合装置1が設定された場所に近づくと、自動的に非接触カード2が指紋照合装置1からの電波による呼びかけに対応して指紋画像データを電波で送出し、この指紋画像データを照合用メモリ15に格納する。更に、照合者が指紋照合装置1に近づき指紋を読み取る指紋読取部16上に指を載置すると、この指を載置したことによる画像の濃淡の変化に対応して自動的に指の指紋を読み取り、その指紋画像データを指紋画像メモリ18に格納する。そして、両者を比較してその結果を照合結果OK/NGとして出力する。これにより、照合者は指を指紋読取部16上に載置するという簡単な操作のみで指紋照合を行うことが可能となる。

【0044】図3は、本発明の1実施例構成図を示す。これは、図1の構成の実施例構成であって、比較手段19からの照合結果OK/NGを、扉制御部20および表示制御部22に通知した場合のものである。以下説明する。

【0045】図3において、扉制御部20は、比較手段19からの照合結果OKに対応して開錠信号を電気錠21に供給して開錠したり、閉錠信号を電気錠21に供給して閉錠したりするものである。

【0046】電気錠21は、入退出する扉に設置された電気錠である。表示制御部22は、比較手段19からの照合結果OK/NGに対応してメッセージを表示装置23上に表示するものである。例えば照合結果NGに対応して「入室できません」や、非接触カード2が検出されずに指を指紋読取部16上に載置した場合に「入室用カードが必要です」などのメッセージを表示させるものである。

【0047】表示装置23は、メッセージを表示したりなどするものである。次に、図4のフローチャートを用

いて図3の構成の動作を詳細に説明する。図4において、S1は、指紋照合装置1から電波で呼び出しを、照合者が所持する非接触カード1が受ける。これは、照合者が非接触カード2を所持し、指紋照合装置1が設置されている場所に近づき、指紋照合装置1の非接触カード用アンテナ11から発射された電波による呼び出しを、非接触カード2が受信する。

【0048】S2は、S1で電波で呼び出しを受けた非接触カード2が自己のID番号を電波で送信する。S3は、辞書を検索する。これは、S2で送信されたID番号を指紋照合装置1の非接触カード用アンテナ11が受信し、非接触カード制御回路12が受信した信号中からID番号を取り出して辞書特定手段13に渡し、辞書登録位置情報を生成しこれをもとに指紋画像データ辞書14からID番号の指紋画像データを検索して取り出す。【0049】S4は、指紋画像データを照合用メモリ15へ格納する。これは、S3で指紋画像データ辞書14から取り出したID番号の指紋画像データを照合用メモリ15に格納する。

【0050】S5は、指紋検出か否かを判別する。これは、S1ないしS4の処理に並行し、指紋読取部16が照合者の指が載置されたか否かを判別、具体的に言えば指紋読取部16で読み取った画像の濃淡が所定閾値よりも大きくなったか否かを判別する。YESの場合には、照合者の指の指紋画像が検出されたので、S6に進む。NOの場合には、S5を繰り返し行い待機する。

【0051】S6は、S5のYESで照合者の指の指紋画像が検出されたので、指紋読取部16を構成する光学センサ部16-1およびCCD素子16-2によって読み取った指紋画像を、アナログ・デジタル変換部17によってデジタルの指紋画像データに変換して指紋画像メモリ18に格納する。

【0052】S7は、照合して一致か否かを判別する。これは、比較手段19が、指紋画像メモリ18から取り出した照合者の指の指紋画像データと、照合用メモリ15から取り出した指紋画像データ（非接触カード2から読み取ったID番号をもとに指紋画像データ辞書14から読み出した指紋画像データ）とを比較し、類似度・相関度を求めて所定閾値以上で一致か否かを判別する。YESの場合には、S8で扉制御部20へ開錠通知を行い、電気錠21を開状態にし、照合者が部屋に入室する。一方、一致しない場合には、最初から繰り返し行う。

【0053】図5は、本発明の装置の取り付け例を示す。これは、例えば図3、図6指紋照合装置1を取り付けた例である。動作を説明する。

①は、照合者が非接触カード2を所持し、通路を歩いて、高度なセキュリティ管理が必要な室内に入室しようとする。

【0054】②は、非接触カード用アンテナ11が発射

された電波の有効エリアに入る。この状態で、非接触カード用アンテナ11から発射された呼び出しに対応して、照合者が所持する非接触カード2が自動的に自己のID番号（あるいは指紋画像データ）を電波で送出し、受信したID番号をもとに指紋画像データ辞書14から取り出した指紋画像データを照合用メモリ15に格納（あるいは受信した指紋画像データを照合用メモリ15に格納）する。

【0055】③は、照合者が指紋読取部（指紋センサ）16の上に指を載置し、指紋画像を読み取った指紋画像データを指紋画像メモリ18に格納する。そして、両者の指紋画像データを比較し、一致するときに電気錠制御の扉を開き、照合者が高度なセキュリティ管理が必要な室内に入る。

【0056】図6は、本発明の他の実施例構成図を示す。これは、図2の構成の実施例構成であって、比較手段19からの照合結果OK/NGを、扉制御部20および表示制御部22に通知した場合のものである。また、扉制御部20、電気錠21、表示制御部22、表示装置23は、図3のものと同一であるので、説明を省略する。

【0057】次に、図4のフローチャートを参照して動作を説明する。ここで、図4のS2、S3の代わりに、S12の処理を行う。S1は、指紋照合装置1から電波で呼び出しを、照合者が所持する非接触カード1が受ける。これは、照合者が非接触カード2を所持し、指紋照合装置1が設置されている場所に近づき、指紋照合装置1の非接触カード用アンテナ11から発射された呼び出しを、非接触カード2が受信する。

【0058】S12は、S1で電波で呼び出しを受けた非接触カード2が保持する指紋画像データを電波で送信する。S4は、指紋画像データを照合用メモリ15へ格納する。これは、S12で非接触カード2から読み取った指紋画像データを照合用メモリ15に格納する。

【0059】S5は、指紋検出か否かを判別する。これは、S1、S12、S4の処理に並行し、指紋読取部16が照合者の指が載置されたか否かを判別する。YESの場合には、照合者の指の指紋画像が検出されたので、S6に進む。NOの場合には、S5を繰り返し行い待機する。

【0060】S6は、S5のYESで照合者の指の指紋画像が検出されたので、読み取った指紋画像データを指紋画像メモリ18に格納する。S7は、照合して一致か否かを判別する。これは、比較手段19が、指紋画像メモリ18から取り出した照合者の指の指紋画像データと、照合用メモリ15から取り出した指紋画像データ（非接触カード2から読み取った指紋画像データ）とを比較し、類似度・相関度を求めて所定閾値以上で一致か否かを判別する。YESの場合には、S8で扉制御部20へ開錠通知を行い、電気錠21を開状態にし、照合者

が部屋に入室する。一方、一致しない場合には、最初から繰り返し行う。

【0061】尚、図1、図3の構成は、非接触カード2から非接触でID番号を読み取っているため、指紋照合装置1内に指紋画像データ辞書14を予め登録しておく必要があり、指紋画像データが指紋照合装置1側に保管されているので、セキュリティが高く、特定の一カ所の施設などの出入りを管理する場合に適している。

【0062】一方、図2、図6の構成は、非接触カード2から非接触で指紋画像データを読み取っているため、指紋照合装置1内に指紋画像データ辞書14を予め登録する必要がなく、分散した施設などの出入りを管理する場合に適している。

【0063】

【発明の効果】以上説明したように、本発明によれば、指紋照合装置1が非接触カード2から非接触で読み取ったID番号をもとに指紋画像データ辞書14から取り出した指紋画像データを照合用メモリ15に格納、あるいは非接触カード2から読み取った指紋画像データを照合用メモリ15に格納すると共に、照合者の指から読み取った指紋画像データを指紋画像メモリ18に格納し、これら照合用メモリ15および指紋画像メモリ18から取り出した両者の指紋画像データを比較して照合し、照合結果OK/NGを出力する構成を採用しているため、照合者が単に指を指紋読取部16に載置するという簡単な操作で指紋照合を行うことができる。これにより、照合者が従来のように、ID番号をキーボードなどから入力したり、磁気カードをカードリーダーに挿入したりする操作を行う必要がなく、操作が簡単となる。また、本発明の指紋照合装置1を高度のセキュリティ監理が必要な室内への扉に適用することにより、入室者が非接触カード2を所持し、扉の近傍に設置した指紋読取部（指紋センサ）16上に指を載置するのみで指紋照合を行い、一致したときに扉を開錠して入室することが可能となる。

【図面の簡単な説明】

【図1】本発明の原理ブロック図である。

【図2】本発明の他の原理ブロック図である。

【図3】本発明の本発明の1実施例構成図である。

【図4】本発明の動作説明フローチャートである。

【図5】本発明の装置の取り付け例である。

【図6】本発明の他の実施例構成図である。

【図7】従来技術の説明図である。

【符号の説明】

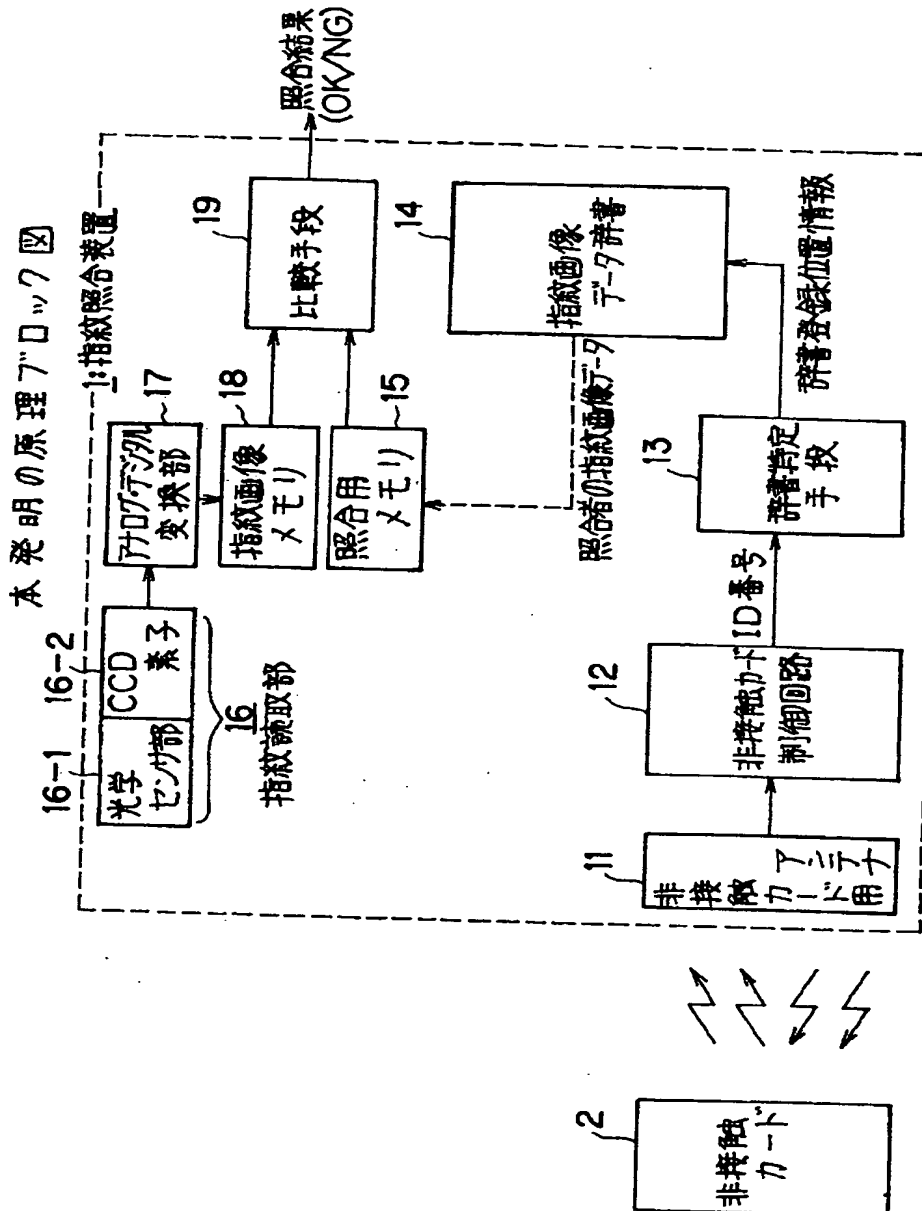
- 1：指紋照合装置
- 11：非接触カード用アンテナ
- 12：非接触カード制御回路
- 13：辞書特定手段
- 14：指紋画像データ辞書
- 15：照合用メモリ
- 16：指紋読取部（指紋センサ）

- 16-1: 光学センサ  
 16-2: CCD素子  
 17: アナログ・デジタル変換部  
 18: 指紋画像メモリ  
 19: 比較手段

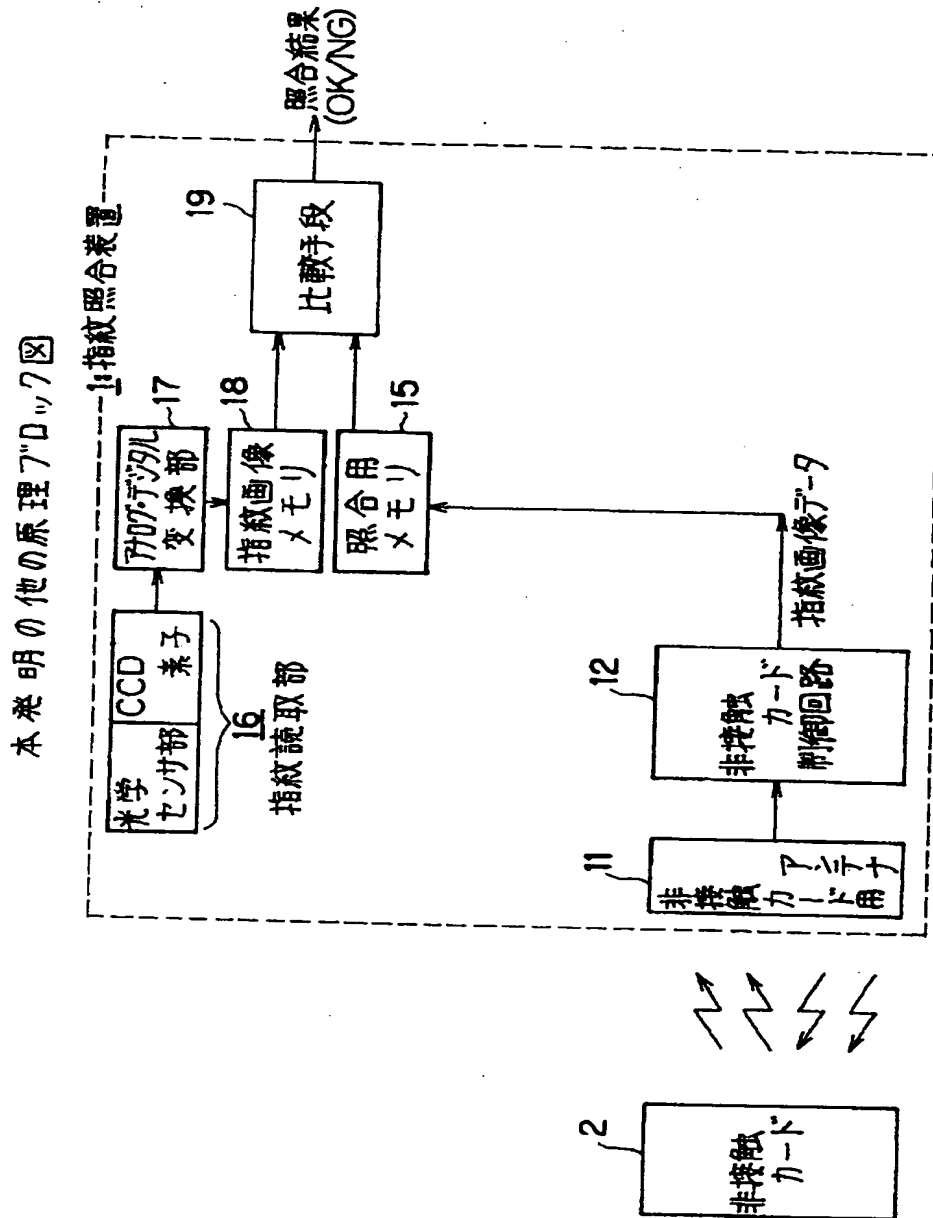
- \* 20: 屏制御部  
 21: 電気錠  
 22: 表示制御部  
 23: 表示装置

\*

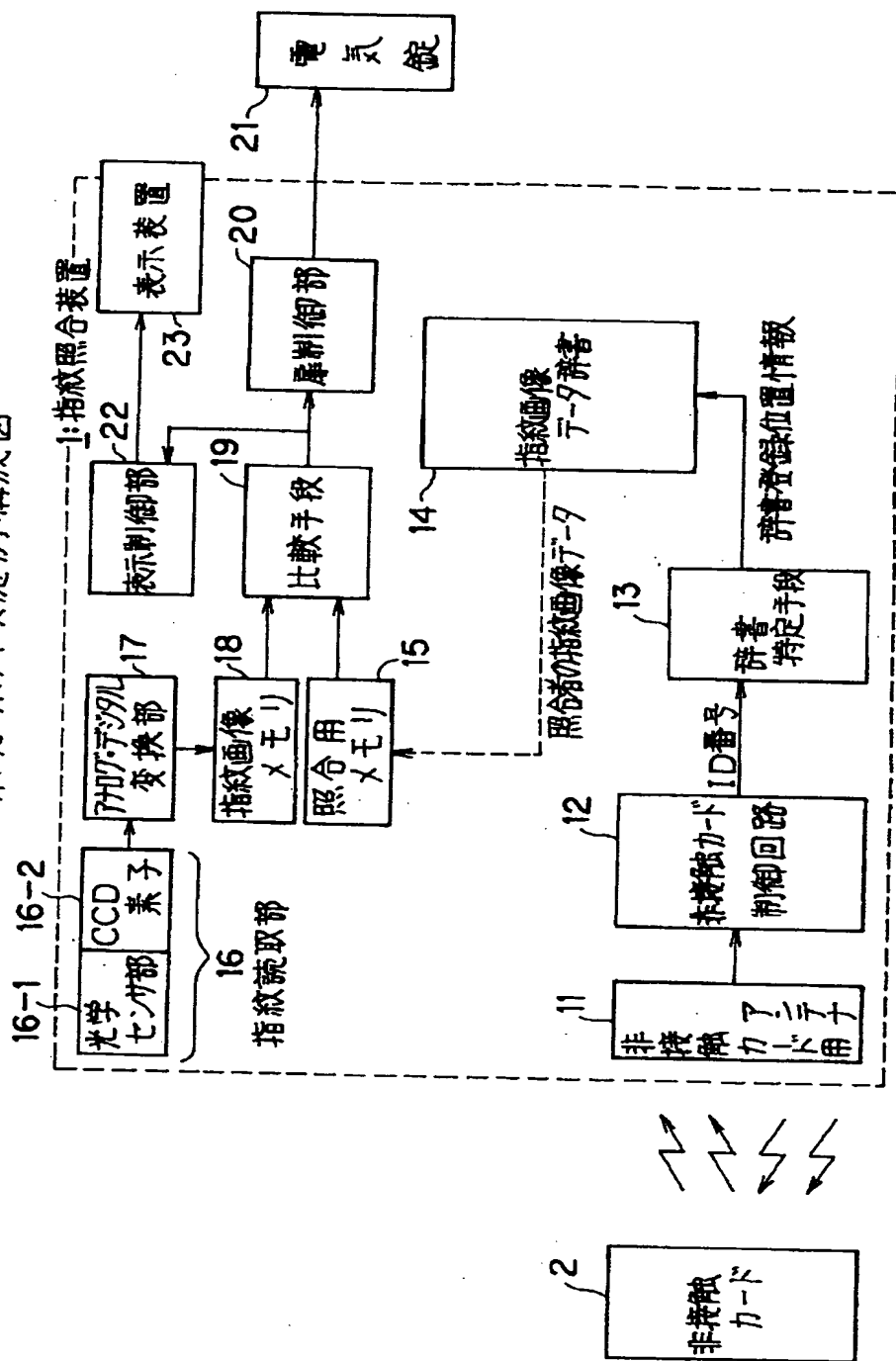
【図1】



【図2】

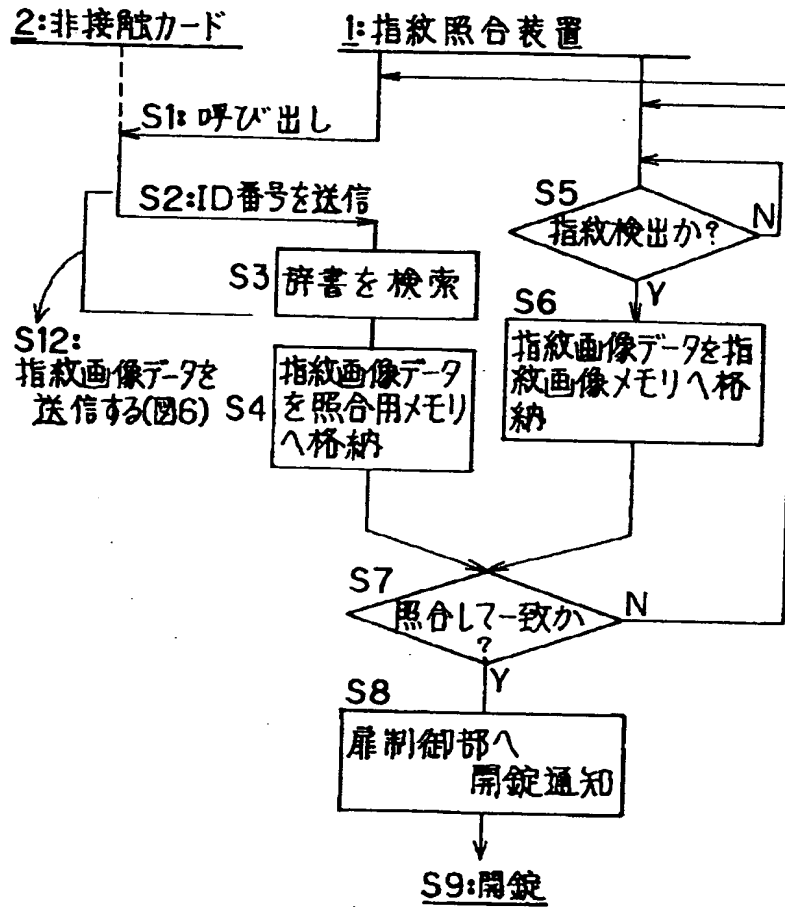


本発明の1実施例構成図



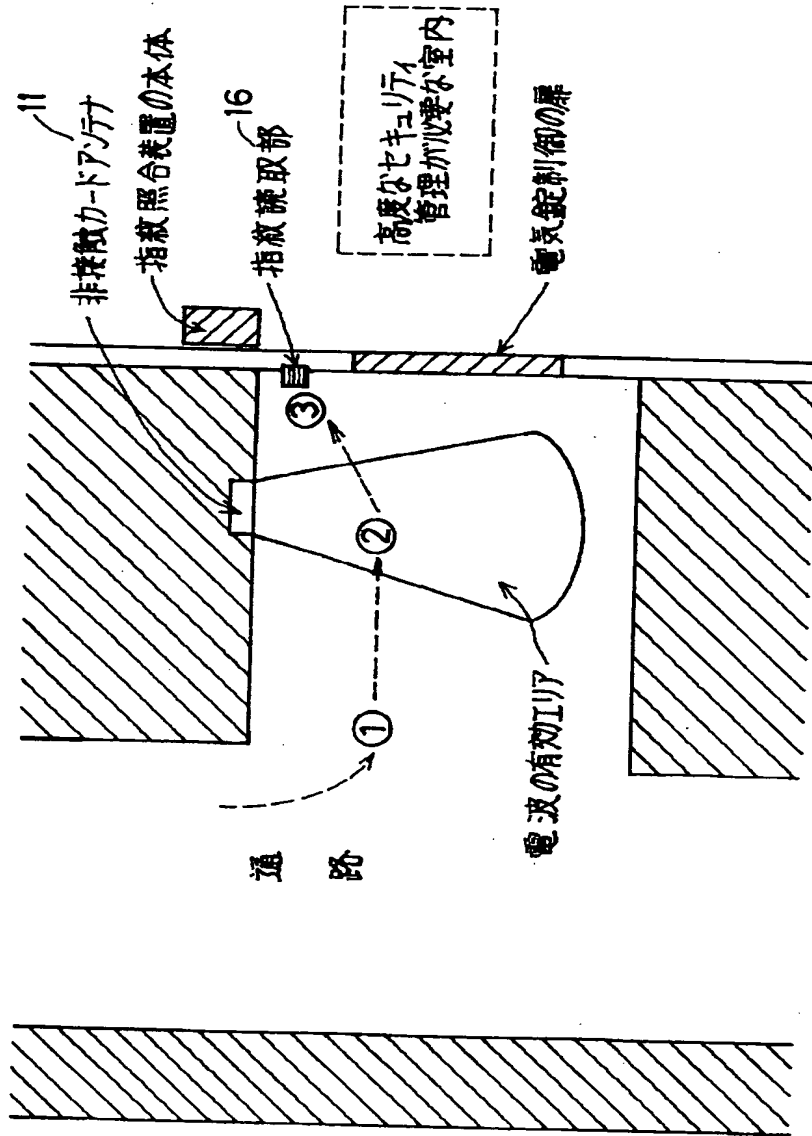
【図4】

## 本発明の動作説明フローチャート



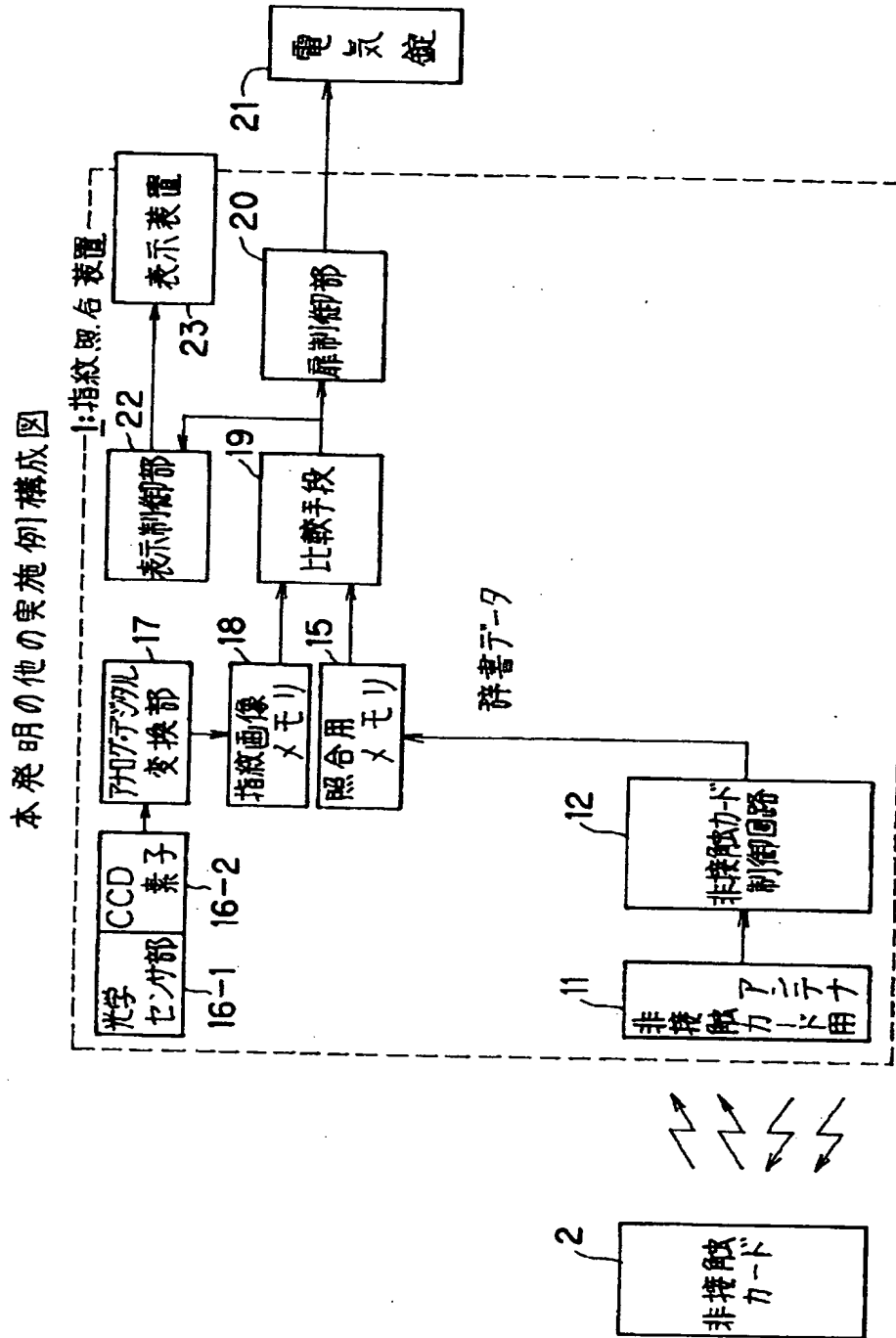
【図5】

本発明の装置の取り付け例



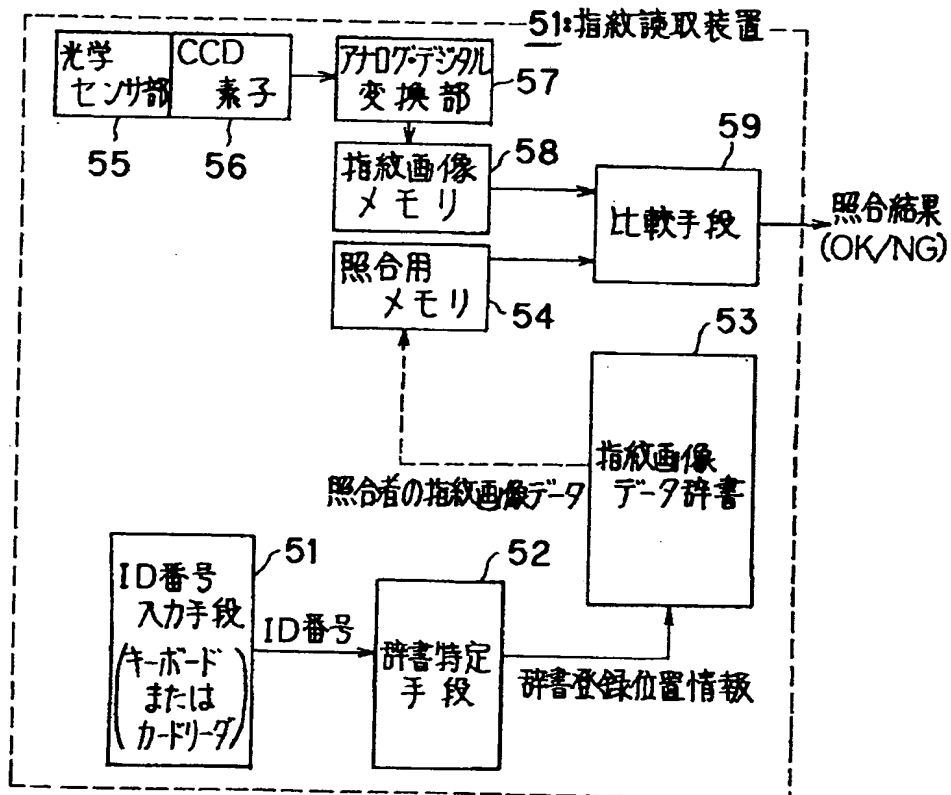


【図6】



【図7】

## 従来技術の説明図



フロントページの続き

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